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IN the early days of traveling auditors an unsophisticated station agent, perfectly honest, and having in the drawer all the cash needed to square his accounts, but with books not in the best of condition, was considerably embarrassed by the unexpected visit of the new inquisitor, "Why," said he, "I am not only willing, but anxious to please you, and to satisfy the company; if you had only let me know that you were coming I would have had everything ready." The innocence of this old-time station agent is matched, in this twentieth century, down in Louisiana, by some enginemen of the Southern Pacific, who are entirely satisfied with surprise checking if only they can have a torpedo signal to give them notice of each test! Both the engineers' and the firemen's organizations have recently served notice on the management demanding that the surprise tests be abandoned, unless with each one there shall be the preliminary torpedo signal. Being thus warned by the explosion that they are about to be "surprised," their peace of mind will, no doubt, be greatly promoted; and the improved (?) scheme thus should redound to their physical and mental health and result in an all-around prosperity. As the brotherhoods depend largely on Congress to help them get whatever they want out of their employer, it should be suggested to them that this proposition be at once sent to Washington. Only, it should be changed around; instead of suggesting that the tests be abandoned, direct pressure should be brought to bear for the prompt introduction of the torpedoes. And they should be used not only occasionally, but should be provided regularly at all signals, everywhere, every day. Then the runner's peace of mind could be almost perfect; he would not need to think at all. But, putting aside levity, the serious thing indicated by such an incident as this is that the local engineers' organizations are too much dominated by their shortsighted members. Every level-headed, reflecting engineman recognizes the value and the reasonableness of surprise checking. Where a vote is passed which takes the opposite view, there is need for a lot of education. And should not the superintendent make it his duty to see that this educating is done? Objections, *of any kind,* which may be elicited by surprise checking should receive his immediate attention. If the surprise checking has been in any degree unreasonable he has the additional duty of educating himself.

OF all the industries the railroads, which are second only to agriculture in magnitude and second to none in the range of requirements for trained men, obtain the least benefit from the colleges and universities of the country. It might be expected that the mechanical department at least, would attract a large number of engineering graduates each year, but actually it absorbs surprisingly few, and of those starting, a very small percentage remain after the first year or two. The results of an effort to discover where the fault lies and how it can be corrected, so far as this department is concerned, are being published in the columns of the *Railway Age Gazette, Mechanical Edition.* In the current issue are letters from Alex. C. Humphreys, president of Stevens Institute of Technology, and D. C. Buell, chief of the Bureau of Education of the Union Pacific, Illinois Central and Central of Georgia, which discuss the subject at considerable length and point out wherein mistakes are frequently made, both by the railways and the universities. Dr. Humphreys suggests a more carefully designed special apprenticeship course for engineering graduates which would supplement the previous college training to the best advantage. He believes that such a course would not require over two years' time. As part of this course he recommends the holding of evening classes for, say, three nights a week, which should be conducted by competent men trained in theory and practice, and would result in more quickly giving an understanding and an appreciation of the practical application of engineering science to the requirements of the railroad. He states that unless these engineering graduates are to receive special treatment as apprentices, which will shorten the term of their apprenticeship, they might better follow some other line of study in the school of experience. Mr. Buell in his letter claims that comparatively few of the engineering graduates who enter railroad service have any definite conception of what railroad work really is, or any goal in the field toward which they are aiming. He suggests that more intelligent and practical vocational guidance be given the members of the graduating classes in the universities and technical schools. In this way a man graduating from one of these schools and entering railroad work would know exactly what opportunities exist and have some idea of the difficulties in the path he has elected to follow. Such guidance, if given by men who thoroughly under-

stand the subject, would no doubt tend to prevent many of the losses which now take place during the first year or two of the special apprentice courses.

THE AMERICAN RAILWAY ASSOCIATION AND RAILWAY ACCIDENTS.

THE railway accident record of this country is not growing worse. It is growing better. The railroad managements are not responsible for the large number of trespassers killed on their properties. Excluding trespassers, the total number of persons killed in the five years 1903-1907, inclusive, according to the statistics of the Interstate Commerce Commission, was 25,083. In the second half of this decade, being the years 1908-1912, inclusive, the total fatalities were 22,817, an absolute reduction of 12½ per cent. less. The mileage of the railways, the number of their employees, the number of trains run, the passenger and freight traffic handled, and the number of persons who used the highways which cross their lines at grade, steadily increased; yet in the first 5-year period the average number killed annually was 5,216, while in the second period the average number killed annually was only 4,563.

While the number of accidents has been reduced, both relatively and absolutely, the need for dealing vigorously and effectively with the accident situation has been accentuated. Public attention has been concentrated on the subject more and more; and unless it is dealt with more vigorously and effectively by the railways action seems almost certain to be taken by the lawmakers and public administrative officials, which will be of very questionable expediency. There are two things which, it would seem, the railway managements should do; first, adopt more comprehensive and thorough-going methods to reduce accidents; second, co-operate with lawmakers and public administrative officials whose intentions are good in framing and securing the enforcement of such legislation as the conditions may warrant.

At its meeting in New York in May, 1912, the American Railway Association adopted resolutions setting forth that its members fully appreciated the need for increased efforts by this organization, by the railways individually and by their employees, for the reduction of accidents, but at the same time deprecating, hasty and ill-advised legislation. Clearly, the American Railway Association, being the principal organization of railways dealing with operating problems, is the proper body to deal with the subject of accidents. Since the resolutions mentioned were adopted, a number of very bad wrecks have occurred, and there has been an almost unprecedented storm of public agitation regarding this general matter. The Interstate Commerce Commission has investigated some of these wrecks, and, it is understood, will, when Congress meets in regular session in December, make recommendations for legislation. The American Railway Association will meet in Chicago on November 19. Will it be prepared then, after the passage of a year and a half since its resolutions were adopted, to take some constructive step?

It will be extremely unfortunate for the Association and for the railways if it is not. It will be unfortunate for the association, because there is a large and growing element among its members who criticise it with increasing outspokenness and vigor on the ground that while it seldom does the things that it ought not to do, it often does not do the things that it ought to do. And the criticism is just. Its course too often recalls the sower in the parable who went forth to sow, and cast his seed on shallow and stony ground where the birds speedily came and picked it all up. It has had the opportunity for years to deal aggressively and constructively with all large operating problems. But the negative forces in it have so often been more potent than the positive forces that its record of achievement has fallen very far short of what it ought to be. If it ever had opportunity to do a constructive work which imperatively demanded to be done it has that opportunity now. Somebody is going to deal more effectively with the accident problem. If it is not the American Railway Association it may be some other railway organization. Already other organizations have sprung up to do work which seemed properly to belong to the American Railway Association but which that organization would not undertake or which, when it had undertaken it, it bungled. If the great, pressing problems are to continue to be left thus to be dealt with by other organizations, how long can the American Railway Association hope to maintain its prestige and to continue to receive the loyal and active support of its membership?

While the American Railway Association will suffer if it does not meet the issue presented by the accident problem squarely and deal with it manfully and courageously, the railways will suffer still more—unless, indeed, some other organization steps in and does what that association ought to do. The lawmakers, the commissions and the public are looking to the railways, and rightfully looking to them, to do something more about accidents than they have been doing. If the railways do not do so, the lawmakers, the commissions and the public will surely undertake the task themselves.

Doubtless many persons question in their own minds what the American Railway Association or any other railway organization can do. The things that ought to be done by the railways are well known. First, they ought to make the best practicable use of such financial resources as they have to put their structures and equipment in the best practicable condition, so as to reduce to a minimum accidents due to physical causes. But main causes of accidents other than those to trespassers are disobedience or mistakes of employees; and the remedies are better supervision and better discipline, including more care, more perseverance and the use of more scientific methods in selecting, training, promoting, checking up and disciplining employees. The various railway associations have devoted much investigation and discussion to the matter of improving structures and equipment in the interest of safety. Where is the railway organization that is devoting thorough and constructive investigation and discussion to the best methods of improving the personnel of the railways—not merely to getting better raw material, but also to working that raw material into a finished product that will do its intended work as it should do it?

It may be said that this is a matter which ought to be left to the managements of the individual systems. But is there so much to be gained by investigation, the interchange of views and the adoption of recommended practice regarding structures and equipment, and little or nothing to be gained by investigation, discussion and the adoption of recommended practice regarding the selection, training, promotion and disciplining of employees? The employees are opposing the adoption of "surprise" signal checking where it is not used, and seeking its abolition where it is used. Is the matter of the color of the signal lights that should be used one which can profitably be investigated and acted on by a railway association, but the matter of "surprise" checking one which cannot be profitably investigated and acted on by a railway association? The American Railway Association is revising its Code of Train Rules. Is the matter of the rules that ought to be adopted one which is suitable for investigation and action, and the matter of the means which should be used to ascertain whether the rules are being obeyed and to secure obedience to them one which is not suitable for investigation and action by any railway organization?

When the government regulates railways it applies uniform regulations to them. Why cannot the railways adopt and apply to themselves regulations of all the kinds that are needed to promote safety which shall be uniform, at least, for railways which are similarly situated and thus to a large extent make government regulation obviously unnecessary? As not only accidents due to physical conditions, but accidents due to conditions as respects personnel, reflect discredit and bring criticism and punitive regulation, not only on the roads on which the accidents occur, but also on all other roads, why should not all

the roads concertedly study and take some form of action regarding the conditions in respect to personnel that cause accidents, as well as in regard to the physical conditions that cause them?

It would seem that the American Railway Association ought to take up the whole problem of accidents and deal with it courageously and perseveringly on broad, constructive lines; or that it should delegate this work to some other organization, giving it full power to act; or that it should wash its hands of the entire matter and let some other organization be formed that will deal with it effectively. If the American Railway Association itself is to handle the problem, some fundamental changes in its organization and methods must be made. It must develop means for securing more constructive investigation and discussion; and, what is of far greater importance, it must develop means for causing its members to do the things that they ought to do. It is of little moment for eminent railway officers to meet in solemn session for three hours twice a year to hear and adopt committee reports unless the action taken at these meetings is to be courageous and constructive and unless that taken by the railways collectively is to serve as a guide for the railways individually. As past experience has shown that many members of the association will not live up to its recommendations unless practically compelled to do so, has not the time about come when the association should adopt some means for compulsion? Or will the railways, instead of adopting some means for compelling each other to do the things which they ought to do, leave all of the coercing to be done by the government?

JUGGLING RAILWAY STATISTICS.

THE unreliability of statistics, especially when they are made, not by those who are trying to ascertain facts, but by those who are trying to prove what they wish to be believed to be facts, has caused various reflections to be cast on statisticians. For example, it has been said that figures do not lie, but that liars often do figure. Also, liars have been classified into liars, damned liars and statisticians. We are always led to ruminate on the wisdom of these sayings when we survey the statistics regarding railways which are worked up and peddled by a certain class of persons.

For example, there is Clifford Thorne, chairman of the Railroad Commission of Iowa, who recently has made up certain statistics to show how much of the return now paid to railway capital could be saved under government ownership. He told the National Association of Railway Commissioners in Washington last week that the par value of the securities of American railroads outstanding in the hands of the public on June 30, 1912, was $15,286,101,957; but he estimated the market value of these securities in October, 1913, at only $13,969,173,383, and he therefore assumed that the government could acquire the railways at this figure. He assumed also that the government would have to pay only 3 per cent. interest on bonds issued by it to raise the money to acquire the railways. He then presented the following table, which shows how he arrived at his conclusion that an immense sum could be saved under government ownership:

Net stock outstanding June 30, 1912	$5,843,446,355	
Dividends paid in fiscal year 1912		$460,432,752
Market value of stocks, October, 1913	$5,554,604,806	
Interest at 3 per cent		166,638,144
Excess in dividends		$293,794,608
Net bonds outstanding June 30, 1912	$9,442,655,592	
Interest paid (estimated on 1911 basis)		$422,782,629
Market value of bonds, October, 1913	$8,414,567,577	
Interest at 3 per cent		252,437,027
Excess in interest		$170,345,602
Recapitulation—		
Saving in stock dividends		$293,794,608
Saving in bond interest		170,345,602
Total savings		$464,140,210

If, as Mr. Thorne figures, a saving of $464,140,210 in the cost of railway capital could be made under government ownership, the *Railway Age Gazette* would declare for that policy right now. For as Mr. Thorne shows, the wages of labor could then be increased $100,000,000 a year, and at the same time enormous sums could be used to improve railway properties and in mitigation of rates. But unfortunately Mr. Thorne, as usual, had not the slightest notion of what he was talking about. He calculated the total interest and dividends of the railways at over $883,000,000. Now, the fact is that even the total net operating income of the railways never in any year amounted to anywhere near that sum. The net operating income in the year ended June 30, 1912, of all roads earning over $100,000 gross—in other words, what they had left after paying operating expenses and taxes—was only $755,869,000; and in the fiscal year ended June 30, 1911, the net operating revenue of all roads was only $773,866,000. These are the statistics of the Interstate Commerce Commission. In other words, the total interest and dividends of the railways as given by Chairman Thorne, exceed their net operating income by over $100,000,000. Mr. Thorne's calculation as to what the government could save is based upon the assumption that it could acquire the railways for $13,900,000,000, on which it would have to pay interest at 3 per cent. But, after the government had deducted $464,000,000 the estimated saving from the total net operating income in 1911, it would have had left only $309,725,712, which, at 3 per cent., would have paid a return on only $10,314,000,000, or $3,800,000,000 less than Mr. Thorne's own estimate as to what the government would have to pay for the railroads!

Clearly, the great railway economist and railway regulator from Iowa has stubbed his statistical toe. As he never would be able to find out where, we will tell him. While he places the total interest and dividends paid at $883,000,000, the fact is, that the interest paid in 1911 *on bonds outstanding in the hands of the public* was only $380,411,667, and the dividends paid *on stock outstanding in the hands of the public* were only $291,497,164, a total return to capital of only $671,908,831, or $211,316,550 less than Mr. Thorne's figure. Of course, a little matter of $211,000,000 is of no consequence to a man so rich in statistics as Mr. Thorne, but railway investors missed the money terribly! The reader may be interested to know how Chairman Thorne could have fallen into the mistake of computing the total interest and dividends paid as in excess of the total net operating income by over $100,000,000, and in excess of the interest and dividends actually paid out by over $200,000,000. His error consisted in using the figures for *gross* interest and dividends, where he should have used those for *net* interest and dividends. The duplication in the securities of American railways caused by the intercorporate ownership of bonds and stocks causes a similar duplication in interest and dividend payments; and it is only by eliminating these duplications, amounting in 1911 to over $200,000,000 a year, that we can arrive at the interest and dividends actually paid.

After having found Mr. Thorne blundering thus about the interest and dividends paid we might naturally expect to find him falling into other errors; and in this we are not disappointed. His assumption that the government could acquire the railways for $13,900,000,000 is based on an estimate made by him of the market value of the securities in October, 1913. Even assuming his estimate to be correct—a very dangerous assumption—it is well known that railway securities stood in October, 1913, at one of the lowest levels that they have ever reached; and it is just as irrational to base an estimate of the value of railways on extremely low market prices as on extremely high market prices. Furthermore, nowhere near all railway securities changed hands in October, 1913, a sufficient demonstration that those who did not sell at that time would not take for their securities the prices then current. Again, Mr. Thorne's estimate that the government would have to pay only 3 per cent. interest is wide of the mark. Neither the government of the United States nor that of any other country on earth could now issue 3 per cent. bonds at par purely as an

investment security. Any government would be fortunate, in the present state of the money market, if it could market them on materially less than a 4 per cent. basis. It is likely, in case the United States government acquired the railways, that it would have to pay for them at least $16,000,000,000, and that its interest rate would not be less than 3½ per cent. Even on that basis the interest payments of the government would be over $100,000,000 less than the interest and dividend payments of the railways. But that would not go far in enabling it to raise wages, reduce rates and make improvements. Merely a 5 per cent. reduction in rates and a 5 per cent. increase in operating expenses would reduce railway net earnings by almost $236,000,000 a year; and that there would be an increase of much more than 5 per cent. in operating expenses under government ownership, the experience of the world clearly indicates.

Mr. Thorne is not the only public man who juggles recklessly with railway statistics. In a speech published in the *Congressional Record* for October 28, page 483, Senator LaFollette of Wisconsin said: "In 1905 more than 10,000 passengers and more than 48,000 employees were killed on the railroads of the United States." The senator always has been adept at manufacturing railway statistics, but in this case he surpassed his earlier brilliant performances. The "Statistics of Railways in the United States" of the Interstate Commerce Commission for 1905, page 122, state that the total number of railway passengers killed in 1905 was 537, and the total number of railway employees killed, 3,361.

Is it any wonder, when United States senators and members of state railroad commissions put forth such statistics as those quoted from Messrs. LaFollette and Thorne that the public is misinformed regarding railway matters?

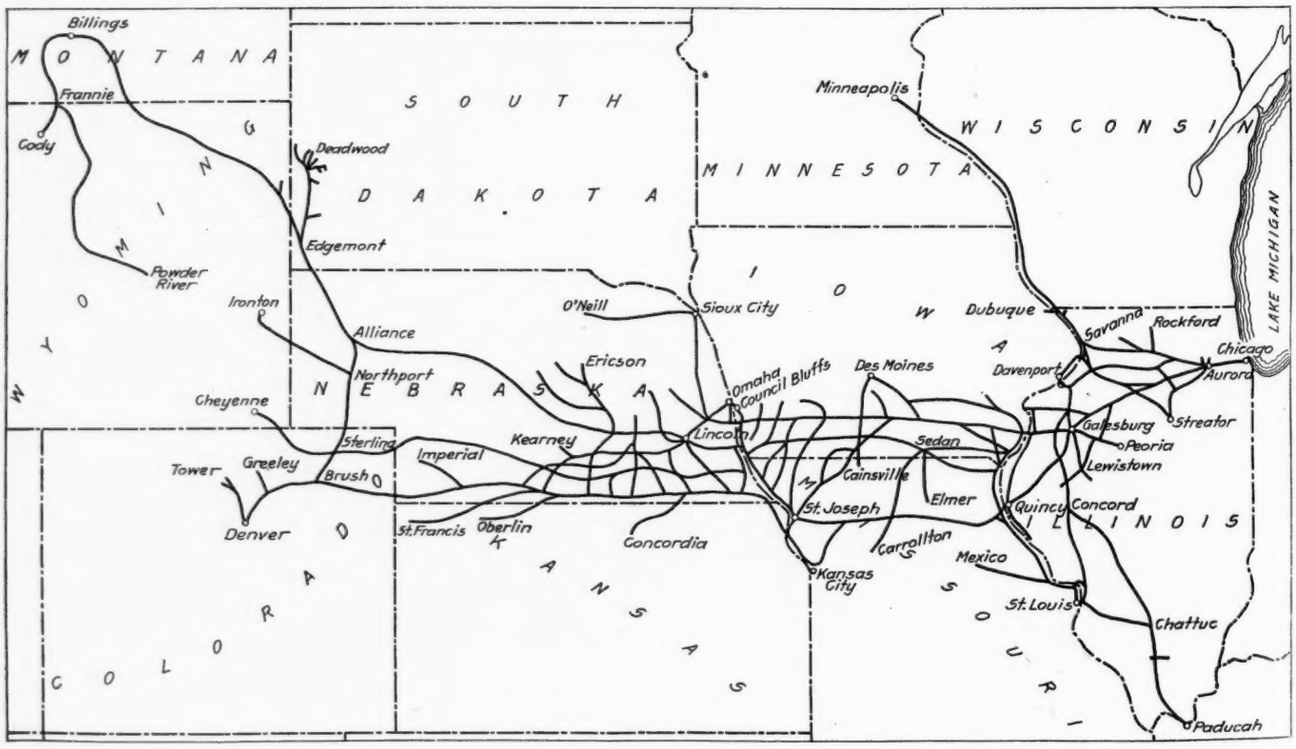
Another example of the dissemination of unfounded statistics regarding railways is afforded by an article entitled "The People or the Railroads," in *Hearst's Magazine* for November. In this article, it is said, "Stock and bonds, the railroad capitalization of the country, totals more than $19,000,000,000. Of this, $10,000,000,000 is 'water.'" A wide discrepancy will be noted between the capitalization figures given by Mr. Thorne and those given in *Hearst's*. The net capitalization of the railways of the United States in the fiscal year 1911, according to the Interstate Commerce Commission, was $15,008,770,570; and Mr. Thorne gives the commission as authority for the statement that in 1912 it was $15,286,000,000. The investment in road and equipment which had been made up to June 30, 1911, as reported by the railways to the commission, was $15,518,264,612, and up to June 30, 1912, was $15,895,667,769. The statement that $10,000,000,000 of the capitalization of the railways is water, is without a vestige of foundation. Not a scintilla of evidence ever has been cited in support of it, and not one ever can be. The facts are, as has been repeatedly pointed out, that there are some railways that are over-capitalized and others that are under-capitalized. But the evidence indicates, not that the railways as a whole are over-capitalized, but that as a whole they are under-capitalized.

How can it be expected, or even hoped, that the railways of the country will be fairly and intelligently dealt with by the public when public men and the press continue, either ignorantly or maliciously, to give currency to such false and misleading statements as those here referred to?

CHICAGO, BURLINGTON & QUINCY.

IT has been the generally accepted theory in American railroad practice that if a company can make ample additions to its plant so as to keep that plant in shape to handle economically even the peak of the load, then an increase in gross business will be reflected by a more economical handling of each unit of the business and consequent increased net earnings. The Chicago, Burlington & Quincy showing in the fiscal year ended June 30, 1913, bears out this theory to a rather remarkable extent.

The Chicago, Burlington & Quincy operates 9,109 miles of road, a large proportion of it branch line mileage, carrying in 1913 956,000 ton miles per mile of road and 125,000 passenger miles per mile of road, and with its freight tonnage made up of about 31 per cent. bituminous coal, 20 per cent. products of agriculture, 16 per cent. manufactures and about 7 per cent. lumber. The Burlington is controlled jointly by the Great Northern, and the Northern Pacific, and is conservatively capitalized—if we mean by capitalization the issue of capital securities. On the other hand, the investment in the property is very large and the policy of further investment each year for a number of years



The Chicago, Burlington & Quincy.

past has been unusually liberal. It seems fair to assume, therefore, that the results obtained in 1913 are at least in part attributable to this policy.

Total operating revenues in 1913 were $94,374,000, an increase of 8.7 per cent. over 1912, while total operating expenses amounted to $62,843,000, an increase of but 3.6 per cent. In other words, the Burlington reduced its operating ratio from 70 in 1912 to 67 in 1913. After somewhat larger expenditures for maintenance—slightly less for maintenance of way and considerably more for maintenance of equipment—transportation expenses consumed $29,998,000 in 1913 as against $29,020,000 in 1912. This is an increase in transportation expenses of but 3.4 per cent., while the ton mileage handled increased 14.5 per cent. and the passenger mileage increased 3.5 per cent.

In 1912 the Burlington had an average train load in freight service of 484 tons and an average number of passenger miles per passenger train mile of 62. Multiplying the total passenger mileage by 7.3, the ratio of passenger miles per passenger train mile to ton miles per freight train mile, we get a composite unit of service which, for comparative purposes, will reflect an increase either in freight train or passenger train loading, and a reduction in cost handling either freight or passenger business. Transportation expenses per thousand of these units in 1912 was $1.85. Applying the 1912 ratio to 1913 business, the transportation expenses per thousand units were $1.75. When we take into consideration the showing that has been made by other roads in the 12 months under review, this reduction in transportation expenses per unit of business on the Burlington is remarkable.

The freight train load in 1913 was 438 tons, an increase of 10.5 per cent. With the previously mentioned increase of 14.5 per cent. in ton mileage there was an increase of but 4.1 per cent. in freight locomotive miles; and while passenger train mileage increased very slightly in conjunction with the increase of 3.5 per cent. in passenger miles handled, passenger locomotive miles actually decreased slightly, totaling 17,862,000 in 1913. This shows that while the Burlington did not reduce its passenger service, it succeeded in effecting economies even in this service by reducing the ratio of locomotive miles to train miles.

In 1913 a total of $13,942,000 was spent by the C. B. & Q. for new lines, extensions, equipment, and additions and betterments. Of this amount $8,441,000 was charged to capital account and $3,898,000 to income. The total appropriation for betterments from income in 1913 was $7,648,000, some of which, of course, was not spent in 1913. Since 1907 the Burlington has charged $21,421,000 to income for additions to property.

The balance sheet of the Burlington is an exhibit of financial strength that can be equalled by few American railroads. Besides the $21,421,000 surplus appropriated for additions to property just mentioned there are $32,943,000 appropriated surplus invested in sinking funds, and $3,750,000 not specifically invested; and in addition, a total profit and loss credit of $91,039,000. Cash on hand at the beginning of 1913 amounted to $8,734,000, and at the end of 1913 to $4,815,000. There has been taken into the treasury a little over $1,000,000 of securities issued or assumed, making the total at the end of 1913 $11,859,000. The company had total working assets of $33,871,000, with total working liabilities of $11,469,000.

The following table shows the principal figures for operation in 1913 as compared with 1912:

	1913.	1912.
Average mileage operated	9,110	9,074
Freight revenue	$64,063,856	$57,740,419
Passenger revenue	21,895,691	21,083,419
Total operating revenues	94,374,486	86,723,068
Maint. of way and structures	12,535,863	13,541,030
Maint. of equipment	16,133,216	14,294,033
Traffic expenses	1,586,803	1,528,115
Transportation expenses	29,997,717	29,020,384
General expenses	2,589,293	2,263,387
Total operating expenses	62,842,891	60,646,949
Taxes	3,563,359	3,303,058
Operating income	27,840,545	22,650,360
Gross income	29,800,475	24,801,401
Net income	19,430,746	14,106,754
Dividends	8,867,128	8,867,128
Appropriations for betterments	7,647,743	3,944,216
Surplus	2,915,875	1,295,410

Letters to the Editor.

A MISSIONARY'S VIEW OF RAILROADS.

Chicago, October 29, 1913.

To the Editor of the Railway Age Gazette:

When traveling on one of our inland China trips, one of the missionaries said to us: "God builds the railroads." We had just remarked something about the help it would be in the work of extending the kingdom when the railroads should penetrate and ramify China. Our missionary friend voiced our convictions exactly, after having traveled for months, as we had, in jungles and desert places, over thousands of miles of backward and undeveloped lands in the old world. The value to human progress, the good done to mankind, by building railroads in those lands can be ascribed to no less a source than to God himself, as he leads his servants in the enterprise of railroad building.

What is true in the Orient is just as true in the Occident. We often hear people condemning the railroad corporations and operations. But how many of those people, who are ready to condemn, have ever analyzed the proposition: "What would we do? Where would we be as a country, or a people without the railroads?" While the railroads have shared and are sharing in the profits accruing from the progress they have mightily helped to produce, yet they are not beginning to get the "lion's share." The bulk of those profits is going and has gone to the people, most of whom have done comparatively little to accentuate those gains, except to draw their breath and their inheritance. This is one of the ways God, by his spirit, leads the world forward and cares for the human race, viz.: by leading large-brained, world-visioned men to plan and execute great programs in the commercial and industrial world, as well as in the world political and religious, scientific and social: and these men are all co-laborers together with God and master workmen as brothers in the same kingdom building business—missionaries, if you please. The Pere Marquette system of railway and lake steamer transportation is named after the missionary Marquette, the first white man to sleep where Chicago now stands, and who explored the Illinois river down to the Mississippi and the Mississippi down to the Arkansas.

Thus, the missionary of the church is intimately associated with the missionary of commerce; the two work hand-in-glove together for the upbuilding of the kingdom of God. Here is the testimony of one whose company illustrates what we are saying:

> We go into a land stricken and barren and unprogressive, a land where women are hitched to the plows and men strive all day in the sun for a bare living, and we hand them the magic power of machinery. We make it possible for one man in an hour to do the day's work of three. We remove forever the haunting dread of famine; the joy of living takes the place of bitter struggle. The people are left emancipated to new happiness and education and real worship.

It is easy to find fault with all kinds of missionary work, and with all missionaries. They are pioneers; and they should not always be judged by the standards of settled and carefully adjusted society. They venture into untried and unknown fields, and if "wrecks" and "accidents" occur, occasionally, they are not to be set down always to criminal carelessness, or to wilful wickedness. The wonder is they do as well as they do. We have been traveling now for twenty-five years; during the past ten years we have averaged over 50,000 miles a year; perhaps we have traveled a million miles; most of this travel has been done on railway trains; and we have never been in a railway wreck.

We believe not only that God builds the railroads through his human agents, but that he also gives his spirit to the men who operate them, and thus enables them to further the welfare and progress of mankind, and to hasten the coming of the kingdom of God on the earth. These men, from the president of the road to the humblest engineer and switchman, from the train despatcher to the humblest telegraph operator and conductor, should have the prayers of Christian people the world around, and should be recognized as worthy servants of the most high God.

Charles E. Bradt,
Central District Secretary, Board of Foreign Missions, Presbyterian Church.

NEED FOR CO-OPERATION BETWEEN RAILWAYS REGARDING OPERATION.

Chicago, October 20, 1913.

To the Editor of the Railway Age Gazette:

One of the most remarkable things that confronts a student of the operation of American railways is the fact that there are no methods of operation which in their details are admittedly universal practice. It is amazing that after so many years of dealing with problems practically alike in their major features we cannot put our finger on one and say, "this is dealt with in this way."

While doubtless there is more or less difference in the exact form in which these problems present themselves on different roads, yet fundamentally the difference is one of form only, not of principle. And yet even where a similarity of principle is admitted the methods of treatment are widely dissimilar.

Contrast the conditions on the traffic side.

Years ago the circumstances under which traffic was secured caused frequent meetings of traffic men; and the associations which were then built up, and which were for a long time necessary for the partial protection of the revenue of the individual railways, have continued as clearing houses, through which officials of the traffic departments keep in touch with each other and with the developments which have gradually converted those departments from mere bureaus of solicitation into what they are today; and incidentally into a machine against which the operating men are well-nigh powerless in any disputed issue. But the operating man remains a more or less cheerful individualist. He gradually loses his cheerfulness as he climbs the ladder, but his individualism usually remains unimparied.

It is only in recent years that this situation has become important. Within the business life of any man forty years old railways were comparatively small things, each of which was usually dominated by a relatively strong man; one who had not been trained in his business, but who, as his road grew from small to larger, had grown with it, meeting his problems as best he could, solving difficulties as he came to them, gradually building up precedents for his own road, and, by the force of his own ability, not only creating his own traditions, but also training subordinates to accept those precedents and defend those traditions.

As consolidations occurred and the size of properties increased, these men's methods usually were extended over the lines each acquired. In some lamentable cases they were not, and then there were two or more traditions struggling for the mastery. In few cases, however, was there any conscious reaching out to ascertain what other roads were doing or cordial willingness to absorb and adopt practices in lieu of those already in use. If a man was peculiarly effective, instead of other roads adapting his methods to their conditions, the man, himself, was acquired by some other road and set to work to apply his treatment in his new environment, while his successor in his old job upset what he found there.

The coming of officials to new railways, then, usually was followed by a season of turmoil when many of the familiar customs were overset and those of another road substituted; and this period of confusion usually lasted until the new displaced the old, or *vice versa*, depending upon the length of time which the newcomer felt they could devote to it, or in some cases upon the patience of the financial people under punishment.

The history of some of these revolutions, and subsequent reversions to type, if written, would be both interesting and improving, if only some one who knows enough about them would undertake to write their history.

But what has been the result? Briefly this:

The time is at hand—is indeed now here—when railway operation is to be scrutinized and its methods justified. Can it be done?

In the cases of many individual roads, undoubtedly, but in all—certainly not.

Regulation of carriers in the future will more and more deal with what we call operating functions, and that regulation will fall upon the road which is justified as well as upon the one whose failures make the regulation necessary.

Necessarily, all decisions must be reached by a series of compromises. It is, therefore, obvious that to bring about that reasonable uniformity in practice which is desirable, so-called standards, whether of work or of practice, should not be considered merely as bases of variation but as things which mean something, and for whose maintenance all are equally responsible.

It is axiomatic that methods on some roads which other roads would characterize as indefensible have caused such operating legislation as has already been passed. Unless some exchange exists for the interchange of information and some internal policing is done it is inevitable that one by one subjects will be reached and enactments made which will force a uniformity which may be unwholesome and certainly burdensome, while a wholesome uniformity is still within our power. This wholesome uniformity cannot, however, be brought about from the top only. It is the youngest men who are the most individualistic. The older ones have merely the inertia of long habit.

Is it not possible that the younger men can be encouraged to join and attend associations of those of their own class instead of being discouraged, as is often the case? Is it not fairer to them to do so? No one road contains all knowledge, even for its own conditions.

Should not associations of the junior classes work at something definite? Should there not be places where intelligent interchanges of opinion can take place? Should not their conclusions receive at least respectful attention, and intelligent discussion from senior associations, composed, as they are, of the more responsible officers?

But while this may be done to educate the present subordinate officers in the principle of the co-operation which the times will require them to exercise when they come to positions of greater responsibility, it is too late to wait for a new generation so trained.

There is but little time left to get together. Each year sees new regulations which produce costly uniformity, although enacted ostensibly to promote safety or equality of treatment.

Only one course may perhaps stop the steady progress of new legislation—roads which are deficient in their practices or lacking in their enforcement of proper practices must come to the standards of those more fortunately situated—and how shall they do this if no one shows them how?

If this be not done, it is certain that they will be brought to standards set by legislation, and when that happens all are served alike.

Surely the time has come when those agencies which have served their purpose in the past, but which have been shifted to the rear by the progress of events, must be re-established upon effective lines. To consider subjects at infrequent meetings of committees composed of over-hurried men, to debate reports of such committees in perfunctory fashion, if at all, to put forth resolutions involving practices and standards which would have utterly changed their form had there been any idea of enforcing them—these are the methods of a day now past.

The times call for bodies which will obtain intelligent and complete data and make it available for everyone, that will procure adequate discussion and the careful formulation of enforcible recommendations—and that finally will see to their enforcement.

To preserve a measure of the individual initiative which has brought American railways to their present generally efficient state, part of that initiative must be sacrificed.

It will be hard to do this. It would be easier to sit still and lose it all. But if the officers of strong roads wish to make the best fight they can for the independence of their own properties they will agree among themselves upon a uniform application of correct operating principles, and then go out into the highways and hedges and compel their deficient neighbors to come in.

It will take time and thought and much hard work, but it can be done.

Experience.

THE SUPPLY DEPARTMENT OF THE RAILWAY.*

Its Purposes and Functions and Their Importance, and Its Proper Place in the Organization of the Operating Department.

By George G. Yegmans.

The manufacture and sale of transportation is the most complex industry of the business world. The attraction which the railroad business possesses for the average man lies in the great variety of the problems which it presents for solution. Even in the daily routine of operation the unexpected is constantly occurring, and must be met by the ready resourcefulness of the individual, but its real attractiveness lies in the multiplicity of the functions which are inherent in its organization. No matter what the natural taste or inclination of the individual may be, if it leads him toward the strenuous activity of modern business life, his energies may find a suitable outlet in one or more branches of the railway service.

The traffic department typifies the art of true salesmanship, with all that the word implies.

The studious investigator of facts, as disclosed by figures, finds ample scope for his talents in the accounting and statistical departments.

The transportation department presents a wide range of opportunity for the man whose nature craves a position on the firing line; the man of executive ability, who does not shirk responsibility.

The trained engineer finds work ready to his hand in any branch of his profession, civil, mechanical, hydraulic, electrical, structural, architectural.

The large repair shops which every railroad maintains afford an outlet for the energies of the practical mechanic, and their successful management calls for a high order of mechanical as well as executive ability.

All of these different phases of the railroad life are more or less familiar because they come quite prominently into public view. Their nature, and the opportunities they offer for individual success, are so well known as to need no extended explanation of their advantages or disadvantages.

But there is a branch of the service about which little has been heard until within recent years; which, while it occupies a sphere peculiarly its own, is, at the same time, closely allied to the other departments, and which affords another important but less well known opening for preferment in the railroad service. This is the supply department. In its modern form this department is of comparatively recent origin, and as a matter of fact is still only partially developed, but its possibilities as a factor in railway economies are being slowly demonstrated and recognized. The main obstacle in the way of its more rapid progress is the fact that its real work, its capabilities and its limitations, have not been sufficiently crystallized to afford an undisputed basis for the organization to rest upon, or for the formulation of definite and uniform methods of operation.

A great many of the more conservative element still contend that there is nothing to be gained by such an organization, and that the old system, under which the head of each department procured and cared for the material which he required, is the best. Nevertheless, the general plan of having such work performed by a separate organization is constantly gaining favor. A good many railroads today have a supply department, but very few of them are alike either in management or methods. They are in all stages of development and consequently present varying degrees of usefulness. The results so far obtained under these differing systems are not unform, and are not always what have been expected or hoped for, and this sometimes leads to a hasty condemnation of the department as such, instead of the faulty organization or inferior methods which have been relied upon. What is most needed at present is a clear and definite idea of the proper functions of such a department, of the importance of the work which it undertakes to do, of the reasons for its existence, and of the form of organization and method best calculated to produce the sought for results.

*An address delivered before the Business Club of Harvard University.

THE NATURE OF THE DEPARTMENT'S FUNCTIONS.

The supply department typifies the commercial or mercantile phase of the railroad business. It gathers supplies from widely separated sources, receives and cares for them properly, warehouses them when necessary and distributes them, when required for use, to the other departments which are its customers; and it carries on this business in a systematic and methodical manner which insures the best return to the company for the money invested.

It is really merchandising of a high order. The general conception of a railroad storekeeper is a man whose duties consist in arranging a large variety of articles neatly on shelves or in orderly piles, and in handing them out over a counter on demand. There is a popular impression that this is not railroading, and that the storehouse affords no avenue of approach to the real business of transportation. This may have been true once, but it is so no longer. There is the same relation between the man handling bolts in the storehouse, or tallying lumber in the yard, and the manager of the supply department, that there is between the apprentice in the shops and the superintendent of motive power, and the duties of these higher officials are of at least equal importance in the scheme of railroad administration. Further, there is no other one department which comes into such close contact with the daily activities of every other branch of the service, and none which affords equal opportunity to those engaged in the work to learn something of the operations and methods of *all* of the other departments. The man who is thoroughly in earnest, who is determined to really learn the railroad business in all its branches, and is not content with the mere performance of his allotted task, will find no better training school for his talents than the supply department.

Because of its recent origin and its imperfect stage of development, because of the importance of the work it is attempting and the possibilities that lie behind its successful accomplishment, the supply department presents the widest field that is open today in any branch of the railroad service for individual endeavor and achievement. Its real business, which lies at the root of all its activities, is the management of the company's investment in material.

This must not be confused with managing the amount expended for the material that is used in maintaining and operating the railroad. That is an entirely different thing, although the distinction is not always so clear as it should be. Broadly speaking, the aim of every operating officer is to expend money for material only as it is currently used, and if all the necessary supplies could be promptly procured when they were needed there would be no investment in material. But it is necessary that every railroad should have, at all times, a sufficient quantity of material ready for instant use to insure the continuity of its operations and the most economical employment of its working forces. This involves the storage of a certain amount of supplies of a widely diverse nature, which must be so handled as to be instantly available for use when needed, and in this way a continuing investment in material is created.

It is the province of the supply department so to manage and

to regulate this investment as to afford the maximum of insurance at the mimimum cost, and this involves a good many things.

THE IMPORTANCE OF THE WORK.

The importance of this work, and its possible effect on the economical management of the railroad, may be gleaned from official statistics. In 1910, the last year for which definite figures are available, so far as I know, the amount expended by the combined railroads of this country for material used in their operation and maintenance was $247,000,000.

During the three years prior to that time the average value of material reported to the Interstate Commerce Commission as being on hand at the date of the report was $220,000,000. The first figure represents the value of the material used or consumed in the period of one year. The second figure represents the continuing investment in material. In other words it represents unused material, carried on hand from month to month throughout the year, to provide against contingencies, and is in excess of the quantity actually used.

It is the relation between these two figures that the supply department is called upon to regulate.

The material used by the railroads, including fuel, constitutes the largest single item of expense, except the pay roll. It consumed in 1910 over 17 per cent. of their gross earnings. The pay roll in that year took about 42 per cent., but the interest on their funded debt only amounted to about 13¼ per cent., and there was no other single item of expense that exceeded 5 per cent. of the gross revenue. The continuing investment in material almost equals the annual expenditure for material actually used. and the proper management of that investment is surely a matter of sufficient importance to demand our best endeavors. Statistics will also help us to understand why some better methods, than those which have been commonly employed in managing this investment, are desirable. The material ordinarily carried in stock is solely for the maintenance and operation of existing properties. Consequently, there ought to be some relation between the extent of those properties and the service performed by them and the amount of the investment in material.

During a period of thirteen years, ending in 1909, the miles of road operated increased 28 per cent. The miles of track increased 41 per cent. The number of locomotives in service increased 59 per cent.; the number of cars 71 per cent. The combined percentage of increase in these items was 66 per cent. The number of tons moved one mile increased 84 per cent., while the fixed investment in material increased 225 per cent. in the same period. This does not look quite right on its face, although the comparison instituted is a very rough one at best. It seemed apparent, however, that this large investment was getting out of control and growing to undue proportions, and the effort to regulate it if possible has led to the establishment of the supply department.

It is obvious that if any definite results were to be obtained the whole subject of material must be reduced to some concrete form. There must be some way of securing definite, accurate and comprehensive knowledge of the transactions in material as such, and as a whole, without regard to divisional or departmental lines. It is also plain that in order to form a reliable basis for action this information must be entirely uniform in character and must embrace all classes of material. This was practically impossible where each department was independently responsible for the material which it was using.

The simplest and best remedy was to transfer the entire responsibility for work of that nature to a body of men working under a single supervision, to accomplish that particular result, with nothing to divert their attention from the main issue. This feature was lacking under the old system. To the men who are actually doing the work, material is only a means to an end, not the end itself, and consequently it receives only secondary attention. Moreover, the only thing that vitally concerns them about material is its absence—not its presence— and yet it is the latter which constitutes the investment which it is desired to regulate. When there is plenty of material on the ground their attention is demanded by more important matters than the mere detail of handling and caring for it. This is natural and right, but it helps to explain the increase of 225 per cent. in the investment, and the necessity of entrusting the management of this investment to men who have no more important duty assigned to them.

Before the introduction of the supply department as an independent element, the head of each operating department was practically supreme in regard to all material required for the operations under his charge. He procured the quantity he considered it advisable to have, and accounted for its use by means of monthly reports to the auditor. His accounts were accepted as correct because nobody else knew anything about them, and their accuracy was demonstrated by an annual inventory, which he took himself, of the material in his charge.

WHY THE SUPPLY DEPARTMENT SHOULD BE INDEPENDENT.

It is not a good arrangement to let the one who is directing or actually doing the work control the accounting for the material that is used in it. He should be at liberty to specify the kind, quality and quantity required for actual use on the work in hand, and should draw his requisitions on the supply department accordingly, but it is better that the actual handling and accounting for it should be done by a disinterested party. This introduces a systematic check not only on the use of material, but upon its abuse, waste or loss, which is often of great advantage to the head of the other department himself, as it sometimes brings to his personal attention shortcomings on the part of his own subordinates which might not otherwise be exposed. It is not at all a question of distrust of the individual, as many are inclined to infer, but purely one of good organization and of instituting proper safeguards about the investment in material wherever practicable.

In turn each of the other departments constitutes a separate check on the operations of the supply department, as they jealously watch the amount which is charged to them for the material with which they are supplied.

Briefly then, the supply department, when properly organized presents a comprehensive and condensed view of the entire situation as regards the transactions in material which cannot be so clearly obtained in any other way. It ensures better care, and thus helps to prevent loss and waste, and provides a more accurate accounting for material as such, than is possible under a divided responsibility or under conditions which render such work of secondary importance. It introduces the element of a systematic and disinterested check on the use of material by all the other departments and is in turn checked by them.

By concentration of the control and supervision of all material it renders the stock as a whole more flexible, prevents unnecessary duplications, and ultimately produces economy in handling it.

Most important of all, it permits of an intelligent regulation of the whole investment in material, and its adjustment to the actual requirements of the service in a manner not otherwise practicable.

While this is a difficult task it is entirely possible to accomplish it. The investment must be large enough to render it humanly certain that no lessening of the ordinary daily receipts of material will delay the regular, orderly and economical progress of the work. Anything less than enough creates incalculable loss, and anything more is sheer waste, for unapplied material is only money in another form, and unnecessary material is money thrown away.

Directly involved in any real regulation of this investment are the functions pertaining to the supply department. They include the procuring of all of the requisite material, the handling of all material as it is received and its distribution to the work, the custody and care of all unused material, and finally the accurate accounting for all material coming into its possession, in such a manner that the entire transactions connected with it shall be clearly and briefly placed before the executive officers.

SHOULD HANDLE AND ACCOUNT FOR ALL MATERIAL.

I want to emphasize the use of the word "all" in this connection. No half way measures are available. It is divided authority that is responsible for the conditions which have made the supply department a necessity in the scheme of railroad organization.

The fundamental principle underlying its work is the regulation of the stock of material, but you cannot regulate anything if you do not control it, and you cannot regulate the whole, if you control only a part. This applies with peculiar significance to the material used by a railroad, because the very nature of the work demands that it be scattered over wide areas, and renders adequate supervision almost impossible unless it is coupled with actual physical control. This feature of the work has been one of the great drawbacks to the success of the department on many railroads, and constitutes one of the main reasons for their failure to produce the results expected. In some cases this has been due to the supply department itself. In its present anxiety to show an economical performance it loses sight of the effect on future results, and permits, or even encourages, other departments to continue the performance of duties which should pertain to it alone. In other cases the management has either feared to entrust the physical handling of the material entirely to the supply department on account of its imperfect development, or has been persuaded that it is more economical to have such work done by the forces available from the other departments.

There has seldom been a greater fallacy than this seriously entertained, or one more plausibly presented by those who seek to retain unhampered control of the unused material.

The true situation is this: Under the old methods, where each department handled its own material with its own forces, the prevailing practice was to charge the payroll labor direct to the operating accounts. No attempt was made to ascertain how much of the labor was devoted to handling the material and hence the true cost of the work was never in evidence.

The fact is, that nobody knows whether the work was being done economically or not, because nobody knows what it cost, and there are no standards to go by. The claim of greater economy, therefore, is at least open to further discussion and proof.

There are, however, a few facts that are self-evident: The company uses a certain amount of material each year. This material all has to be handled and accounted for. If this work is properly done so as to protect the company against loss, it costs a certain amount of money which the company pays, and the total cost is not less because a portion of it is charged on the books to some different account.

One of the advantages gained by entrusting the physical control of all material entirely to the supply department is the exposure of the true cost of handling it in a manner that prevents concealment, and the segregation of all the charges incurred in that class of service in such a definite and precise manner as to permit of close scrutiny and effective supervision, a thing that has never been accomplished in any other way.

The ultimate effect of such a course is real economy in the cost of handling material, which is at best an unwelcome but necessary expense.

The failure to form a concise and definite idea of the real functions of the supply department has led to some misconception of the place which it should properly occupy in the established organization of the railroad. All kinds of places have been assigned to it by its advocates and its adversaries, and there still seems to be a great diversity of opinion among managing officers, judging from the various forms of organization that are found on different railroads.

RELATION TO THE PURCHASING DEPARTMENT.

One of the chief points of confusion appears to be its position with relation to the purchasing department. This arises chiefly from two causes: First, when the supply department was originated, the purchasing department was the only one in the field whose functions pertained exclusively to material; and, second, the failure to distinguish between the act of purchasing material and the function of procuring material which must be exercised by the supply department in its work of stock regulation. The distinction is, however, very real.

Perhaps the true positon of the department will be more clearly understood if we reflect that no new or original duties were imposed on it when it was established. Its work consists solely of carrying out certain duties which had previously been attempted by the other branches of the operating service, each for itself, and which were transferred to the new department. It is virtually composed of those parts of each of the other operating departments whose duties were co-related, and consisted of procuring, handling, distributing and accounting for material.

This seems to fix the official status of the department on a footing of equality with the other operating departments, and to place the chief supply officer on the staff of the chief operating officer to whom the heads of those other departments report. There is no more reason why the head of the supply department should report to the purchasing agent than there was for the heads of the other departments to report to him when they were handling their own material.

I like to think of the supply department, not as something separate and distinct from the other operating departments, as they are with respect to each other from the very nature of their duties, but as an integral and vital part of each one of those other departments from which it has sprung; giving each of them its best efforts, because their work is its work; serving them better if possible than they could serve themselves, yet not subservient to them.

This whole question will some day settle itself in a satisfactory manner, on the basis of results obtained and their relation to the net earnings. The real significance of the work is rapidly dawning on the railroad world, and with the realization of its importance comes the demand for bigger and brainier men to manage this investment in material. Already the far sighted executives of four of our largest western systems have given the rank of vice president to the heads of their supply departments and are making this branch of the service as attractive as possible to ambitious and energetic men. One of the greatest needs of the railroads today is properly organized control and systematic regulation of their investment in material by men who have not only fully grasped the practical side of the many difficult questions involved, but who thoroughly understand the true relation of those practical questions to the still greater questions of railway economics. They need trained thinkers, men of brains and of ideals, working in their storehouses and mastering the problems of practical detail in their supply yards, men who will see and comprehend the true importance of the results which hang on their efforts, and will one day be able successfully to direct the management of the company's investment in material.

NEED FOR RAILWAYS IN NEW SOUTH WALES.—The demand for more railways in New South Wales is becoming more acute. The Minister of Railways, together with the progressive section of the Legislative Assembly, is convinced that increasing transportation facilities must be provided without further delay. The development of the country is being seriously retarded; and the rate of railway construction which has obtained hitherto, is so painfully slow that it will take years to relieve the situation to any appreciable extent. Meanwhile, ambitious farmers and new settlers are becoming impatient at being landlocked and unable to get their products to market. The Minister of Railways, being aware of these facts, also recognizes that further delay in putting forward a practical program of construction would not only increase the difficulty of procuring the necessary funds in the London market, but would also mean that the taxpayers would have to pay higher rates and charges, seeing that other countries needing urgent development are offering higher terms to English capitalists.

TRAIN ACCIDENTS IN SEPTEMBER.

Following is a list of the most notable train accidents that occurred on railways of the United States in September, 1913:

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	Kil'd.	Inj'd.
†2.	N. Y. N. H. & H.	North Haven.	rc.	P. & P.	21	33
†22.	Long Island	College Point.	bc.	P. & P.	3	71
23.	Georgia	Greensboro.	rc.	F. & F.	1	2
24.	Buffalo, R. & P.	Indiana, Pa.	xc.	F. & F.	0	5
25.	C. C. C. & St. L.	Joan.	rc.	F. & F.	1	9
26.	Yazoo & M. V.	Kenner, La.	rc.	P. & F.	0	3
23.	Atlantic C. L.	Beresford, Fla.	bc.	P. & F.	1	4
29.	Delaware & H.	Lanesboro.	bc.	F. & F.	3	1

Derailments.

Date.	Road.	Place.	Cause of Derailm't.	Kind of Train.	Kil'd.	Inj'd.
9.	Pennsylvania	Wileys, Ohio.	unx.	P.	1	38
9.	Missouri Pac.	Boonville.	d. track.	P.	0	13
12.	Mo. K. & Tex.	Lewisville.	.....	P.	0	5
16.	Pennsylvania	Coatesville.	b. rail.	P.	0	3
18.	Chi. B. & Q.	Trempeleau.	fire.	P.	0	8
20.	Chi. R. I. & P.	Manhattan, Kan.	unx.	P.	0	20
22.	Great Northern	Mukilteo.	b. axle.	P.	1	44
24.	Bessemer & L. E.	Branchton.	unx.	F.	0	2
24.	Balt. & Ohio.	Youngstown.	d. eq.	P.	2	0

The trains in collision at North Haven, Conn., on the second, were southbound passenger trains 91 and 95, and the principal cause was disregard of an automatic block signal, indicating stop, which was passed by the second train in a dense fog. Twenty-one passengers were killed and thirty or more injured. This was reported in the *Railway Age Gazette* of September 12.

The trains in collision at College Point, N. Y., on the 22nd, were westbound passenger 311 and eastbound passenger 308. Both motormen and two passengers were killed, one of the passengers being a conductor off duty. The persons injured were 26 passengers and 29 employees off duty, 16 of the passengers being city policemen riding free. Both trains consisted of steel cars, operated by electric third rail; the westbound was running about 35 miles an hour, and the eastbound about 15 miles an hour. Of the two cars in the westbound train, one was badly damaged; and of the five in the eastbound train, none were much damaged. The eastbound train had been allowed to pass from double track to single track on the time of the westbound, which was superior by direction. The collision occurred a short distance from the end of double track. At this point, which is a junction, the signalman in charge of the interlocking tower, gives eastbound trains the right to the road, the conductor and motorman not being required to examine the train register. The action of the signalman in allowing train 308 to proceed, when he knew that 311 was due and was superior, is inexplicable; he had just been asked by the despatcher concerning 308, which was behind time. The manual block system, to be worked by means of telephones, had been authorized for this section of the road, and it was put into use on September 25, three days after the collision.

The trains in collision near Beresford, Fla., on the 23rd, were a southbound passenger and a northbound locomotive running without a train. One engineman was killed, and four others were injured. Both engines and two cars were badly damaged. The northbound train had encroached on the time of the southbound.

The trains in collision near Greensboro, Ga., on the 23rd, were eastbound freights. A flagman was killed and two other trainmen were injured. The collision was due to the failure of the flagman to protect his train by throwing off a green fusee when it was losing time.

The trains in collision on the Buffalo, Rochester & Pittsburgh, at Indiana, Pa., on the 24th, were a southbound special train carrying officers of the road, and a freight train which was entering a side track but had not cleared the main line. Three officers of the road, one official car attendant, and a flagman were slightly injured. The men in charge of the freight train had overlooked orders regarding the movement of the special.

In the collision at Joan, Ill., on the 25th, an eastbound work train ran into the rear of a preceding freight train, damaging the engine and five cars. A brakeman was killed and two conductors and three trainmen and six laborers were injured. The collision was due mainly to the work train not running under control, under a permissive block signal.

The trains in collision near Kenner, La., on the 26th, were westbound passenger train No. 1 of the New Orleans, Texas & Mexico and a preceding freight. The passenger ran into the freight at pretty good speed; and the locomotive, baggage car, caboose and six freight cars were wrecked. The engineman, fireman and one passenger were injured. The collision occurred at 8 p. m., and was due to improper flagging.

The trains in collision near Lanesboro, Pa., on the 29th, were northbound and southbound freights, each running at about 8 miles an hour. One fireman was slightly scalded and three trespassers, riding on the back end of the tender of one of the engines, were killed. The northbound train, in passing around another train ran past a stop signal and through a crossover to the southbound track, there colliding with the southbound train.

The train derailed near Wileys, Ohio, on the 9th, was westbound passenger No. 31, the "Twenty-Four Hour St. Louis," and 14 passengers, 23 employees and two postal clerks were injured, one employee, the fireman, being fatally scalded. The list of employees includes 10 in the dining car and seven Pullman employees. The train was running at about 55 to 60 miles an hour, and all but two of the eight cars in the train were derailed, one being overturned. All the cars were of steel. The engine was overturned and knocked down one girder of a bridge. This part of the road was not washed out during the March floods, as was reported. The curvature of the line at the point of derailment was one degree, 43 min. Two rails were found broken, but they were beyond the point of derailment and there was no evidence that the derailment was caused by a broken rail.

The train derailed near Boonville, Mo., on the 9th, was westbound passenger No. 32, and ten passengers and three trainmen were slightly injured. The derailment occurred near a bridge and the engine and baggage car broke through and fell into a creek. The derailment was due to breaking of an angle bar.

The train derailed at Coatesville, Pa., on the morning of the 16th, was an eastbound express. All of the cars in the train were of steel construction. The last car of the train was overturned. Three passengers were slightly injured. The cause of the derailment was a broken rail.

The train derailed near Trempealeau, Wis., on the afternoon of the 18th, was the Oriental Limited, No. 52. The train was going at full speed when it entered on a trestle bridge which was afire, but the condition of which had not been seen by the runner in time to stop, the line being curved. Eight passengers were injured, none seriously. The baggage car fell off the bridge at the right hand side and four passenger cars were derailed; three of the passenger cars were badly damaged by the flames.

The train derailed near Mukilteo, Wash., on the 22nd, was an eastbound passenger, No. 4. One employee was killed and 35 passengers, eight employees and one other person were injured. The tender was derailed by the breaking of an axle and, with the engine and baggage car, was ditched. A westbound train was derailed by a part of the wreck, but was not much damaged.

The train derailed at Youngstown, Ohio, on the 24th, was eastbound passenger No. 10, and the engineman and fireman were fatally scalded. The engine was overturned, though it was moving only about eight miles an hour. The derailment is said to have been due to the pilot of the engine catching on a frog.

Canada.—In a butting collision of freight trains on the Intercolonial near Aulac, N. B., on the 23rd of September, four trainmen were killed. The westbound train had run past a station where it should have waited for the eastbound.

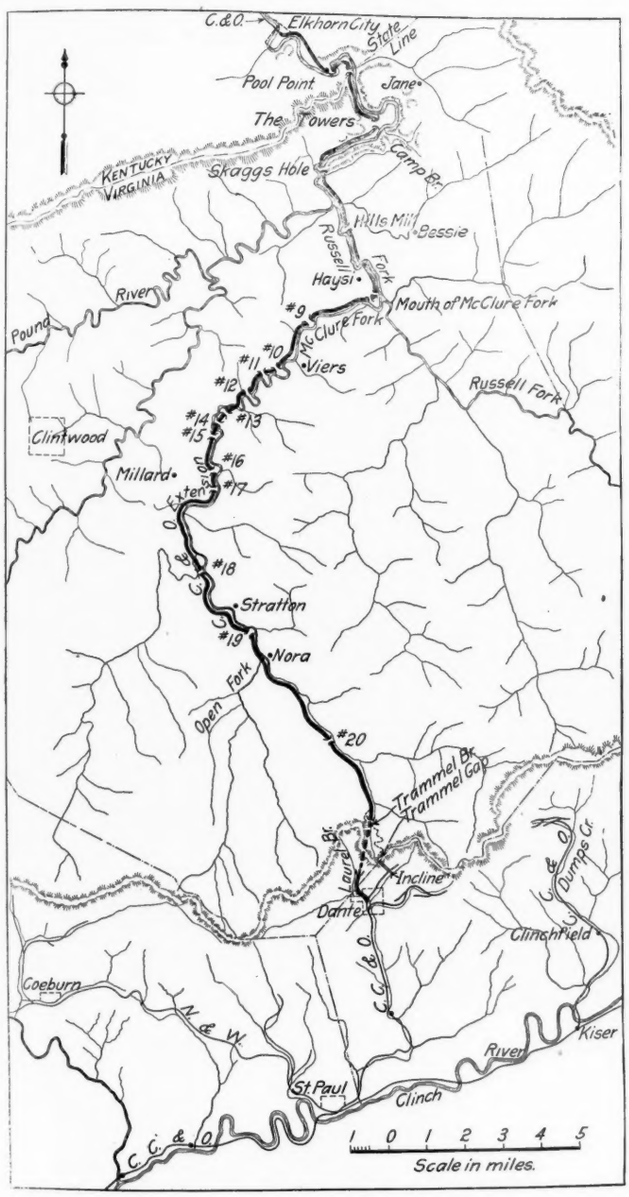
[1]Abbreviations and marks used in Accident List:

rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

CONSTRUCTION OF CLINCHFIELD EXTENSION.

Building a 35-Mile Line Over the Cumberland Range to Give the Carolina, Clinchfield & Ohio a Northern Connection.

The Carolina, Clinchfield & Ohio was built to furnish a direct outlet from the soft coal fields in southwestern Virginia to the markets in the South Atlantic states. This line, which has been operated since 1910 from Dante, Va., the base of operations of the Clinchfield Coal Corporation, south across the Blue Ridge Mountains to Spartanburg, S. C., offers a considerably shorter route for this coal traffic than was available over the lines paralleling the Appalachian chain, and the high standards to



Map of the Elkhorn Extension of the C. C. & O.

which the road was built make it possible to handle this traffic economically. Having accomplished the extremely difficult task of building a good line across the ranges southeast of the coal fields, it was at once desired to secure for the new line a share of the through passenger and freight business from northern and western states by building an extension north from Dante to Elkhorn City, Ky., the southern terminus of the Big Sandy branch of the Chesapeake & Ohio.

A line to connect these points must cross the Sandy Ridge of the Cumberland mountains, which presented so great difficulties to the construction of a satisfactory road that several previous attempts had been unsuccessful. A line was located between Dante and Elkhorn in 1881, and in 1900 the South & Western, predecessor to the Carolina, Clinchfield & Ohio, ran a large number of lines on high and low locations and various standards of curvature and grade. A 16-deg. line could have been fitted to this country quite easily, but in view of the high standards adopted on the remainder of the line and the heavy traffic which is expected to develop, 10-deg. curves were adopted as maximum in the final location, with a resulting increase in the cost of construction of about $1,500,000. Contracts were let for the 35-mile extension in June, 1912, and the work is now nearly completed. It is expected that track will be laid and ballasted over the entire line, with the exception of the Sandy Ridge

South End of Caney Creek Tunnel, Which Was Driven by Hand.

tunnel by the end of this year, and the tunnel should be finished by August, 1914.

It is expected that a large amount of through business with the Chesapeake & Ohio will be handled over this connection in addition to the coal and lumber originating in the new territory that will be opened up. Through passenger service will probably be inaugurated, and as this line will offer the shortest route from Cincinnati and northern points to the Carolinas, Georgia and Florida, and will traverse a country that is rarely excelled for natural beauty, the operation of such through passenger traffic should be profitable.

GRADES, CURVATURE AND QUANTITIES.

With the exception of a little more than a mile at the Dante end, the grade over the entire line is descending toward the north. Dante lies at an elevation of 1,760 ft. on the south slope of Sandy Ridge. The line rises abruptly from Dante, the maxi-

mum rate of grade between the connection with the old line and the tunnel through Sandy Ridge being 1.8 per cent. compensated. The line reaches its maximum elevation of 1,838 ft. near the south end of the 7,804 ft. tunnel and emerging on the north side of the ridge, it follows down the valleys of McClures Fork and Russell Fork for the entire distance to Elkhorn City, where the elevation is 794 ft. To overcome this difference in elevation of 1,044 ft. in 34 miles would require a continuous grade of about 0.6 per cent., so that to secure a practicable line a maximum grade considerably higher than that had to be adopted. North of the summit the grade through the tunnel is 0.5 per cent. From the north portal the line drops down in the valley of McClures Fork on a 1 per cent. compensated grade for about six miles. Just north of the tunnel the new road is 100 ft. above the adjacent stream, and at the bottom of the six-mile section it is only about 20 ft. above water level, which approximate difference in elevation is maintained for a considerable distance. On the next 20 miles the grades are practically the same as the fall of the stream, 0.2 and 0.3 per cent. being the prevailing rates for nine miles, and 0.35 and 0.7 per cent. for the remaining 11 miles. About five miles from Elkhorn City the Pine range is passed in a deep canyon occupied by Russell Fork, and from there to Elkhorn the descent is on a maximum grade of 1.5 per cent. compensated. The heavy grades at both ends of the line will require the operation of pushers out of Dante and Elkhorn City. Mallet locomotives will probably be used on the extension, hauling 2,700 tons with 2-8-0 pushers on the two heavy grades.

As stated above, the maximum curvature is 10 deg. The largest central angle is 136 deg., 42 min., and the total curvature on the line amounts to 6,580 deg., 28.5 min., or an average of about 188 deg. per mile. All curves of 3 deg. and over are spiralled. The longest tangent on the line is in the Sandy Ridge tunnel, being about 9,750 ft. The next longest is near the Elkhorn end and is only 2,500 ft. long. The percentage of tangent is 45.7 per cent.

Practically the entire line is on side hill as the location follows the streams very closely, cutting through tunnels wherever necessary to save distance. In the 35 miles there are 20 tunnels, with a total length of 3.9 miles, so that more than 11 per cent. of the new road had to be tunnelled. The excavation quantities total about 2,250,000 cu. yds., of which about 70 per cent. is rock, in addition to between 300,000 and 400,000 cu. yds. removed from the tunnels. The grading, exclusive of tunnel work, averages somewhat over 71,000 cu. yds. per mile. The masonry is not heavy, being only a little over 1,000 cu. yds. per mile. The total cost of the line is, in round numbers, $5,000,000, an average of somewhat over $140,000 per mile.

METHODS OF HANDLING, GRADING AND TUNNELING.

Although the work is very heavy, the most difficult problem was in getting in material and supplies. The country is extremely rough and in most cases the contractors found no roads suitable for heavy hauling. All equipment and supplies were hauled from four points: Dante; Elkhorn City; Norton, Va., where the L. & N. and Norfolk and Western connect; and Indian, Va., the terminus of a lumber road running north from Honaker on the Norfolk & Western east of the new line. The haul from either of the latter points was from 20 to 30 miles, and in some cases heavy machinery such as steam shovels, compressors and boilers had to be hauled for such distances over the steep mountain roads that were very poorly laid out and maintained. It was necessary for the contractors to spend considerable money in improving the roads and maintaining them during construction work. Steam shovels were used quite generally for handling the excavation on the line in spite of the difficulty in getting in heavy equipment. In all, 13 shovels were in use by the contractors on the 35 miles, varying in size from 20 tons up. In all cases the outfits used with the steam shovels were narrow gage equipment. A fairly large proportion of the excavation was made by hand. In one case a gang of Swedes had a sub-contract for a section about one mile long in which they handled 30,000 cu. yds. of material entirely by barrows.

Most of the small tunnels were driven by putting through a heading for the full length and then taking out a bench to the full tunnel section. Mule carts or small dump carts were used in most cases for taking out the muck. In one case a small steam shovel was used for loading these cars. The timber lining for the tunnels was secured along the right of way, the contract for cutting this timber being given to a local man. Caney Creek tunnel, 400 ft. long, was taken out entirely by hand. The material was a soft slate with a coal seam which proved to be exceptionally good material for ratchet drills. Steam drills were used in two tunnels, and in all other cases air was used.

South End of Sandy Ridge Tunnel.

As an example of the tunnel plants that were installed at points where it was very difficult to get in machinery, the air compressor used by one of the contractors in driving three tunnels about 17 miles from Dante was an Ingersoll-Rand AA2 with cylinders 20¼ in. and 13¼ in. by 18 in. The heaviest pieces handled weighed from three to 3 1/3 tons, which had to be hauled for the entire distance over the very rough mountain roads.

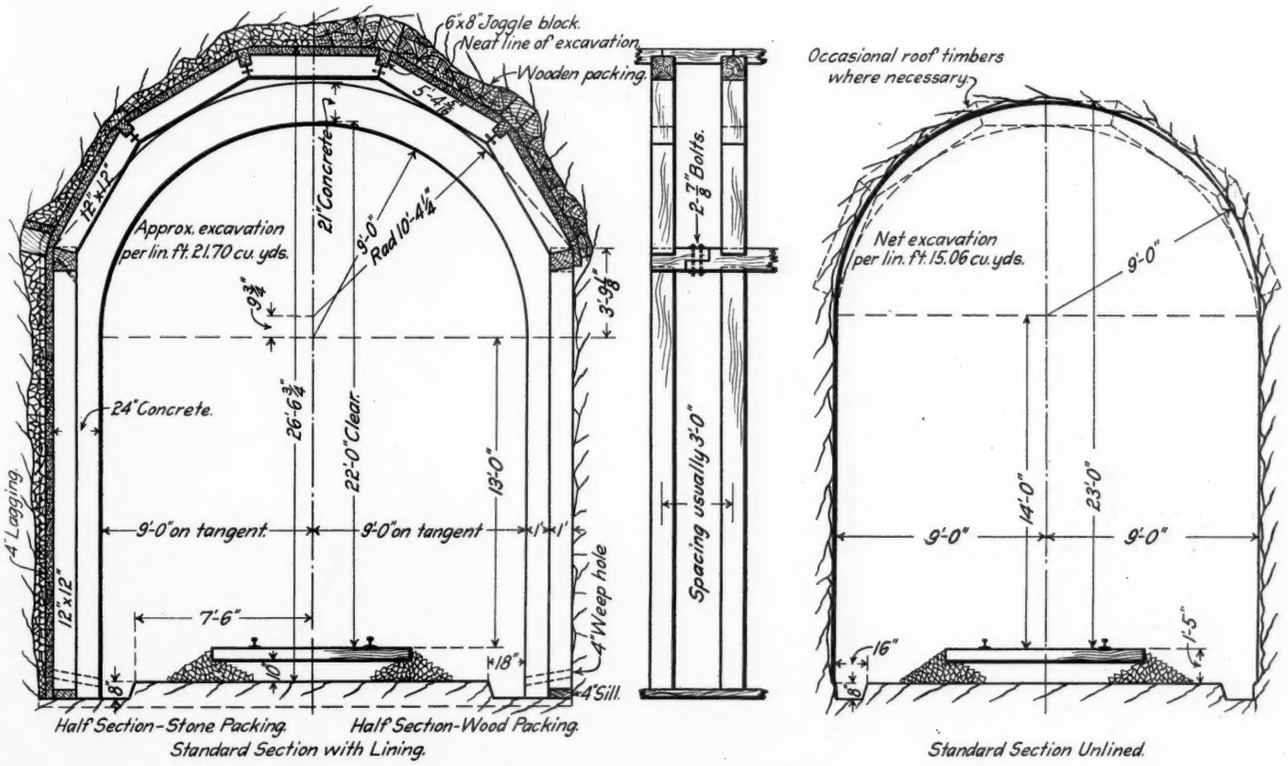
THE SANDY RIDGE TUNNEL.

The connection with the old line at Dante is made near the present passenger station, the new extension turning to the left to follow Laurel branch to the south entrance to the Sandy Ridge tunnel. About 550 ft. of concrete culvert had to be built to carry this stream in a new channel alongside and under the

new line. Several sections of retaining wall with a total length of 286 ft. were built to retain the embankment along this stream. These culverts had mass abutments and I-beam encased decks.

cut has a maximum depth of about 85 ft. and contained 70,000 cu. yds. of material.

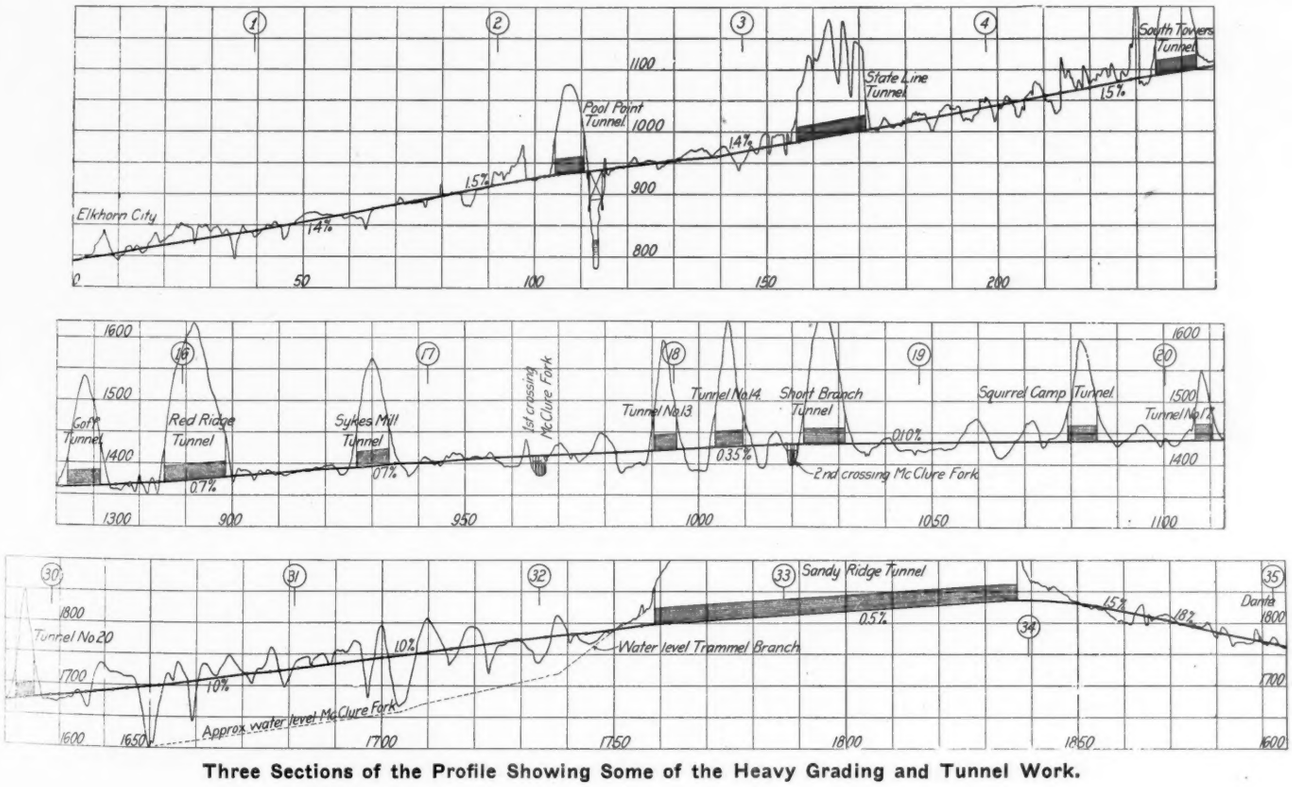
The tunnel under Sandy Ridge is 7,804 ft. long and is about



Standard C. C. & O. Tunnel Sections.

The foundations are 1:3:6 concrete and the tops are 1:2:5 and 1:2:3 concrete. The south approach cut to the tunnel and the necessary stream changes were made by two Bucyrus 70-ton steam shovels with standard gage equipment. The approach

900 ft. under the summit of the ridge. The cross sections used for all tunnels on the line are shown in one of the accompanying drawings. About 255 ft. at the north end of this tunnel was in badly broken material requiring lining, but it is not



Three Sections of the Profile Showing Some of the Heavy Grading and Tunnel Work.

expected that the remainder of the length will require it. The tunnel is being driven from both portals, taking out the full section as the work progresses. The headings are kept only about 12 ft. ahead of the first bench, to provide room for the drills to put in a round of heading holes while the muck from the last charge is being removed. Four 3¾ in. air drills are used in the heading to place about 22 holes in each round. The drills are mounted on columns in the heading and on tripods on the benches. The bench is taken down in two levels, the upper one having six vertical holes in each charge and the lower four. The charges are made with 60 per cent. dynamite.

hour with a drawbar pull of 2,800 lbs., and the smaller 6.8 miles per hour with a pull of 2,000 lbs. The tunnel muck was at first dumped in a big waste bank near the tunnel, but later it was hauled to Dante, where it was used for grading a small yard. In order to load the muck into standard cars a temporary trestle was built along the new standard gage track in the tunnel approach cut at a grade high enough to allow the dump cars to be dumped directly into the C. C. & O. cars. The electric locomotives pulled the muck trains upon this inclined trestle.

The electric and air plants which have been installed in duplicate at the two ends of this tunnel are very completely equipped

Piers for Open Fork Bridge.

In each round, the lower bench is shot first and this is followed by the upper bench and then the heading. The material is of hard slate and sandstone lying in heavy ledges, some of which are as much as 10 ft. thick.

All material is handled by Marion 41 shovels, operated by air and equipped with 1½ yd. buckets. Four-yard dump cars are handled in trains of five by electric locomotives similar to those used in the coal mines in that district. Two types of these locomotives are in use, rated at five and six tons, respectively. The larger type develops a speed of eight miles per

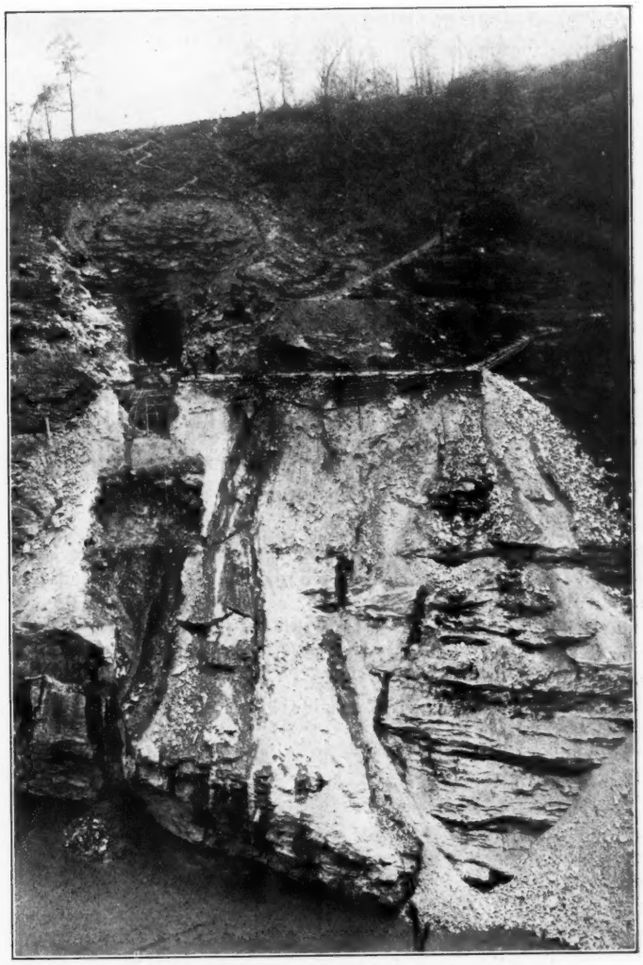
and represent a total outlay of between $60,000 and $75,000. The electric power is secured from a power house of the Clinchfield Coal Corporation on Dumps creek, about eight miles from the tunnel, where current is generated for the company's mines. This power is transmitted at 6,600 volts a.c. on a three-wire transmission line, and is transformed at the tunnel plants to 2,300 volts a.c. by three G.E. type H, 60-cycle, 125-k.v.a. transformers. This 2,300-volt current is used in a motor-generator set to produce 250-volt d.c. current for the lighting circuit and for operating the electric locomotives hauling the

muck trains. Separate lighting and power circuits are run into the tunnel and along the approaches, the locomotives being operated by a trolley system. Electric lights are provided in the roof of the tunnel on the center line one foot below the roof grade for the use of the foremen in getting line and grade.

Compressed air for drills and shovels is furnished by Ingersoll-Rand Imperial type air compressors belt driven from 300-h. p. motors. These compressors have cylinders 25 in. x 20 in.

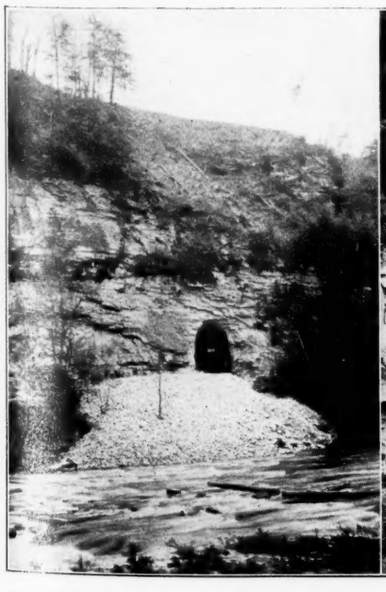
Skag's Hole Tunnel.

and 15 in. x 20 in., respectively. The air is carried at 110 lbs. pressure in an 8-in. line down into the approaches and tunnel headings. Ingersoll-Rand E-44 drills are used, and in addition to the eight drills in each heading, air is supplied to the shovel, two pumps, two well drills and a drill sharpening machine. The latter is operated by two men and is able to sharpen about 200 drills during the day shift. A full stock of drills and repair parts is carried at the site of the work to eliminate delays. A No. 7 Cameron pump is in service at the south portal and a

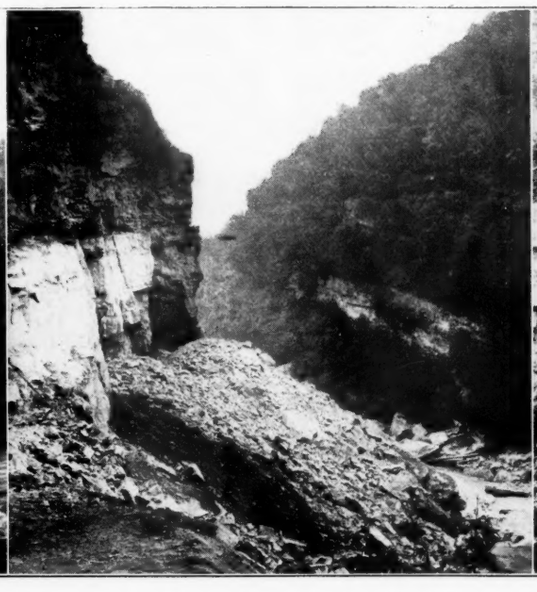


Pool Point Looking Across River Toward North.

14-in. fan line has been installed for ventilating at each end. This ventilating equipment is designed either to draw the air



North Portal of Skag's Hole Tunnel.

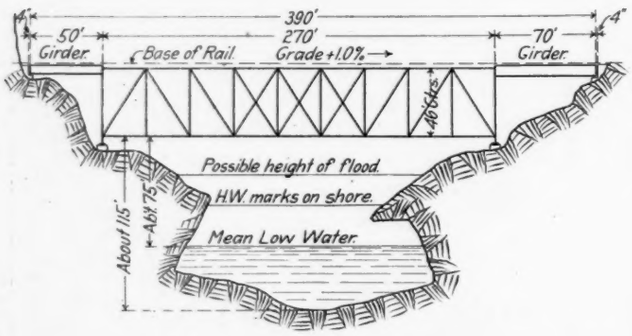


Benching Off Rock at "The Towers" Instead of Tunneling.

North Heading of Towers Tunnel.

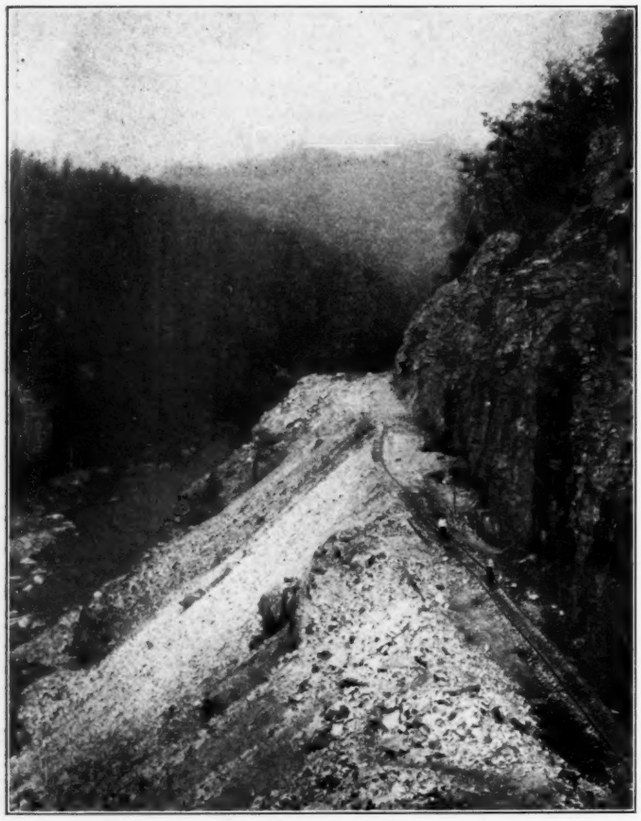
away from the working face or to blow in a stream which can be directed back from the heading to create a draft. About 100 ft. of the complete tunnel section is finished per week.

On account of the extreme difficulty of hauling the heavy equipment needed at the north portal over the rough mountain road from Dante, an incline was built from a mine spur along Middle Fork about one mile north of Dante. This incline is



Elevation of Pool Point Bridge.

about 2,500 ft. long, with an 800-ft. rise, the grade having been fitted closely to the surface of the ground. The top reaches a saddle in the ridge known as Trammel Gap, from which the material can be handled down the north slope to the tunnel plant. Three-foot gage cars with a capacity of about five tons are pulled up the incline by a ¾-in. cable wound on the drum of a 100-h. p. motor-driven engine located at the upper end.



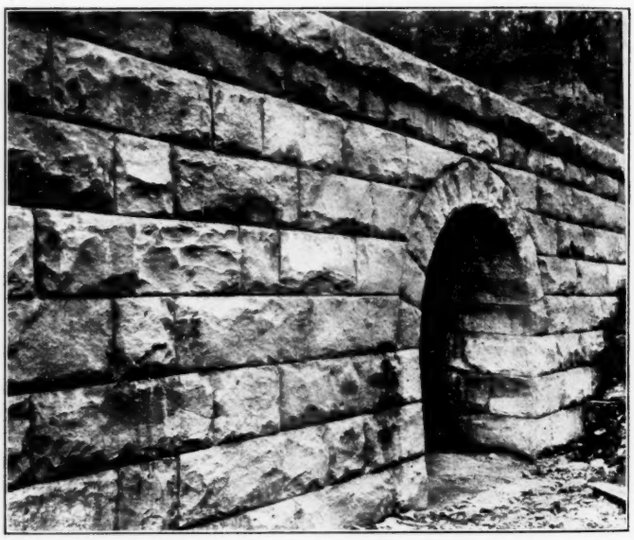
Looking North from Top of Pool Point Tunnel.

A cement and feed house is located at the top of the incline to store perishable material which cannot be hauled away immediately, although every effort is made to handle material as fast as the incline brings it up. The haul to the compressor plant is about two miles, and two specially constructed wagons of 14 tons capacity were built to handle the heavy equipment, such as compressor parts and steam shovels.

The north approach cut is about the same depth as the south and, as mentioned above, the electric and air plant is identical with the one at the other portal. The line emerges from the north end of the tunnel in the little valley of Trammel Creek which runs into McClures Fork less than a half mile from the portal. Some channel changes were necessary to keep the water of this creek away from the line.

SANDY RIDGE TO "THE TOWERS."

The work between the Sandy Ridge tunnel and tunnel No. 20 involved the heaviest grading on the entire extension. The quantities handled in about 2½ miles totaled 417,400 cu. yds. This section of the line is entirely side hill work, the line being benched into rock high above the stream which it follows. In a number of cases gasolene well drills were used for vertical drilling in the rock cuts on this section, 6-in. holes being driven down to grade. Most of the material handled in these cuts was sandstone. Fifty-foot cuts and fills were quite ordinary in this portion of the work, the maximum fill of 154,000



Spring Branch Stone Headwall.

cu. yds. being over Honey Branch, just north of tunnel No. 20, which was nearly 100 ft. high. This fill was made in two levels, the lower level being widened by operating the narrow gage dump cars around a circular track.

There are very few bridges on the line and only one that required a truss span. The line keeps to the west of McClures Fork for nearly 15 miles from the Sandy Ridge tunnel, crossing in this distance only three small creeks which required two or three girder spans each. Just beyond tunnel No. 15 the line crosses to the east bank of McClures Fork on three 72-ft. girders, passes through tunnels No. 14 and No. 13 within the next mile and crosses back to the west side of the stream on a five-span girder structure.

The grading was not extremely heavy in the central portion of the line, with the exception of the tunnels. The stream is very crooked, and in order to improve the alinement, tunnels were used very frequently, but where it was possible to follow the stream the side hill work was not unusually heavy. At one point there were eight tunnels in a little over four miles.

About 23 miles from Dante, McClures Fork empties into Russell Fork, and the new line follows that stream for the remaining distance to Elkhorn. Just north of the mouth of McClures Fork the line crosses to the east side of Russell Fork on three 100-ft. deck girder spans, remaining on that side of the river for about three miles. The next crossing is made at a point

known as Skag's Hole, where the east bank of the river rises almost vertically to a height of about 200 ft. The line cuts through this ridge in a tunnel about 500 ft. long and crosses the river on a five-span deck girder structure, the south abutment of which is inside the portal of the tunnel. North of Skag's Hole the work is comparatively light for about two miles, as the west bank of the stream has an easy slope.

PASSING PINE RIDGE.

At a point known as "the Towers" the line cuts through a tunnel 890 ft. long and in a high ridge between the sides of a loop in the river about 1½ miles long. The work from "The Towers" to the State Line tunnel is the most spectacular on the whole extension. Russell Fork at this point flows through Pine ridge in an irregular canyon known locally as "The Breaks," the mountains rising on both sides from 800 to 1,000 ft. above the river. At a number of points the walls of the canyon are nearly perpendicular. It was first planned to have two tunnels at "The Towers," the north one of the two cutting through a narrow wall of rock extending practically out to the river. As the work progressed it was found that the nature of this rock would not allow the building of a satisfactory tunnel, so that it was decided to bench off this rock wall and lay the line in open cut along the face of the bluff.

Long Concrete Culvert near Dante.

The contractor handling "The Towers" tunnel had one of the most difficult problems on the entire work in getting in equipment and material to his camp. The only access by road to this portion of the mountain is by a very long, crooked trail from Elkhorn City, which winds over the mountain from two to three miles east of Russell Fork. This trail strikes a little stream known as Camp Branch about ¾ mile from Russell Fork and follows down this branch toward the larger stream, which flows into Russell Fork at a point almost opposite "The Towers" tunnel. On account of the inaccessibility of the west side of the stream from the north it was necessary for the contractor to locate his camp and compressor plant along this branch on the opposite side of the river. He hauled all material from Elkhorn over the winding mountain road for 10 miles, taking apart all the heavy machinery so as to reduce the weight of individual pieces. By using six spans of mules, and in many cases helping them with blocks and tackle, he was able to get in two boilers, the heaviest of which weighed 14 tons. He also installed an Ingersoll-Rand compressor with a capacity of 790 cu. ft. per min., and laid about 1½ miles of 4 in. pipe from the compressor to the tunnel headings. All of this pipe, the drills and all powder used on the work had to be carried on men's backs from the camp across the river and up the steep bank to the tunnel portal. In order to reach the north portal which was worked simultaneously with the south, these supplies were carried over the top of the ridge and let down by ropes along the face of the bluff.

The State Line tunnel was much easier to reach, although it also presented many difficulties. It was driven from both portals and a side drift which was run in from the face of the canyon to allow headings to be pushed in both directions from the center. One of the contractors handling grading between "The Towers" and the state line brought in a 20-ton steam shovel over the road from Elkhorn City on the east side of Russell Fork, but owing to high water, had to wait more than six weeks before he could get an opportunity to transfer the shovel across the stream.

POOL POINT BRIDGE.

The largest bridge on the line is across Russell Fork just north of the state line at a point known locally as Pool Point. The grade is about 110 ft. above the water at this crossing and the north bank is so high that the line enters a tunnel immediately after leaving the bridge. In addition to a 270-ft. deck truss there is a 70-ft. plate girder at the south end and a 50-ft. plate girder at the north end. This bridge required the building of two concrete abutments and two piers which proved to be a difficult matter. The piers were located far down the rocky banks of the stream and all materials had to be hauled to the tops of the banks and lowered to these points. All concrete materials were hauled to the east side of the stream, and in order to reach the west abutment and pier, had to be transferred across the stream and then carried by men up the steep slopes and let down again at the site of the bridge. A cable suspension bridge was built across the river at a convenient location south of the crossing and a skip suspended from one of the cables was used for pulling cement and sand across the river. The stone used for the concrete was broken by hand at the site of the bridge and all concrete was mixed by hand. The east abutment and pedestal were not quite so difficult as it was possible to haul directly to a house located on the bank above these foundations. The material was chuted down from this house as required. The masonry for this bridge amounted to 125 to 130 yds. As the stream is subject to sudden and disastrous floods at all seasons, the erection of this bridge promised to be a difficult problem. The bridge company having the contract expects to use a steel A frame.

North of Pool Point tunnel the line follows the east bank of the river to the connection with the Chesapeake & Ohio just south of that company's passenger station at Elkhorn.

STANDARDS OF CONSTRUCTION.

The roadbed standards used on this extension called for an 18-ft. width on fills, 20 ft. in earth and 22 ft. in rock cuts. The track is to be laid with 85-lb. A. S. C. E. open hearth rails, Bonzano joints and limestone ballast. At the north end the first lift will be made on sandstone on account of the difficulty of securing a good grade of limestone in that vicinity. A crusher is being operated at St. Paul on the old line south of Dante for furnishing this ballast and a crusher on the Chesapeake & Ohio just north of Elkhorn furnishes a sandstone used for the first

lift. Passing sidings 4,000 ft. long will be provided at intervals of about seven miles.

Culverts are of cast iron pipe up to 36 in. Concrete boxes and arches are used for larger openings, the minimum box being 2 ft. 6 in. x 3 ft. Stone culverts are used in many places as an excellent grade of stone is available. At one point south of "The Towers" where the line crosses Spring Branch a 10-ft. stone arch, shown in one of the accompanying cuts, was built of stone which was secured so close to the site of the arch that the same derrick which picked up the blocks from their natural bed laid them in place in the arch. The stone in this arch is of the finest grade of brown sandstone laid in 20-in. courses in the walls and 14-in. courses in the arch. There are two short stretches of stone masonry retaining walls near this point which are also built of this sandstone.

The company made every effort to expedite the work, as it was essential that it be completed in as short a time as possible. One of the measures taken to assist the resident engineers along the line in handling their work was the building of a telephone line for the entire distance between Dante and Elkhorn. In addition to the high cost of a line through rough unbroken country, it was necessary to keep two linemen busy all the time repairing and maintaining the instruments and line. It proved a very great advantage, however, especially as all contractors' camps were also supplied with phones, enabling the engineers to get in touch with each other or with any contractor rapidly and easily. This service was naturally very much appreciated by the contractors, who made excellent use of it in pushing their work.

Instead of housing the resident engineers and their parties in temporary shacks, as is almost universally done, it was decided to locate the engineers at points where section and station houses would be needed after the completion of the line and to build these houses for the use of the engineering parties during the construction work.

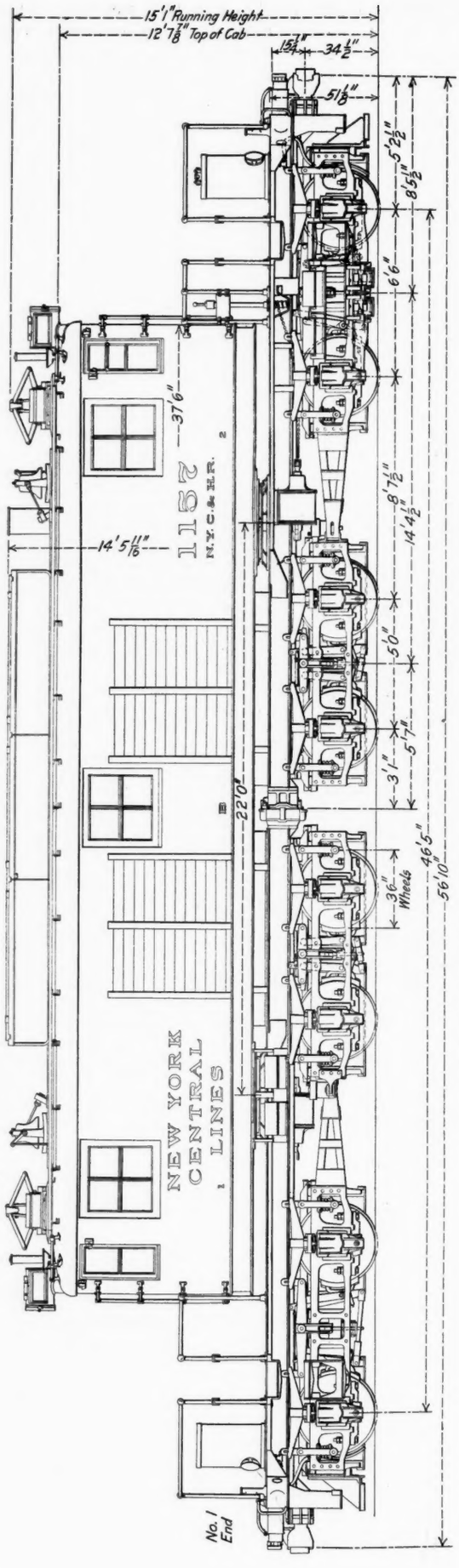
PERSONAL.

The general contract for building the entire line, including clearing, masonry, grading and tunnels, was let to the Rinehart & Dennis Company, Charlottesville, Va. Hollis Rinehart, general manager of this company, has general charge of the work and E. J. Perkins is the superintendent on the ground. The Rinehart & Dennis Company is driving the Sandy Ridge tunnel and seven shorter tunnels with a total length of about 8,000 ft., and handling about 12 miles of grading. The remainder of the work was sublet to 15 companies. The American Bridge Company has the contract for erecting and fabricating all of the steel bridges. A large part of the cement used on the work was furnished by the Clinchfield Portland Cement Corporation, Kingport, Tenn. The railway company will lay the track with company forces. The entire work of location and construction is handled for the company by Ward Crosby, chief engineer. The line is divided into six residencies in charge of the following resident engineers, the order being from Elkhorn south; J. W. Moore. C. D. Stanper, J. H. Charlton, C. P. Norris, L. R. Wilcox and W. C. Hatton. We are indebted to all of the engineers and contractors along the line for courtesies extended in the securing of the above information.

POWERFUL ARTICULATED ELECTRIC LOCOMOTIVES.

The New York Central after making trials early in the present year of an eight-motor articulated 600-volt direct current electric locomotive,* ordered nine more of the same type from the General Electric Company, Schenectady, N. Y. These locomotives weigh, in working order, 200,000 lbs., are of the 4-4-4-4 type and are equipped with eight bipolar, gearless motors, all the weight being carried on motor driven axles. They were de-

*For description see *Railway Age Gazette*, April 11, 1913, page 841.



110-Ton Articulated Electric Locomotive for the New York Central.

signed for operating the heavy limited passenger trains and are capable of hauling 800-ton trains in continual service between the Grand Central Terminal, New York, and Harmon; they are also capable of operating a 1,000-ton train in emergency service, a train of the same gross weight on level tangent track continuously at 60 miles an hour, or an 800-ton train at 65 miles an hour.

As the weight of passenger trains is steadily increasing, and some of the more important trains now weigh over 1,000 tons, it has been deemed necessary to have locomotives for the maximum service with very great continuous capacity, ample overload and high momentary rating. The New York Central has therefore ordered six electric locomotives from the General Electric Company of the same type and general arrangement as the previous ten, but weighing 220,000 lbs. and of materially greater capacity for continuous service. They are capable of exerting practically the same tractive effort continuously that the previous ten locomotives can for one hour.

The ten tons' increase in weight in these machines is accounted for mainly by the greater amount of material in the motors, which are of larger capacity. The speed and torque characteristics have been kept practically the same, but the new locomotives are capable of hauling approximately 40 per cent. greater tonnage in continuous service. The previous ten locomotives can develop 1,460 h. p. continuously, 2,000 h. p. for one hour and as high as 5,000 h. p. for short periods. This corresponds to a tractive effort of 9,000 lbs. at 60 miles an hour continuously, or 13,500 lbs. at 54 miles per hour at the one hour rating. The six new locomotives will develop 2,000 h. p. continuously, or 2,600 h. p. for one hour. The equivalent tractive effort is 14,000 lbs., at 54 miles an hour continuously, or 20,000 lbs. at 49 miles an hour at the one hour rating. They are able to haul 1,100-ton trains in continuous service between the Grand Central Terminal and Harmon, 32.6 miles, are capable of operating 1,200-ton trains in emergency service, and 1,200-ton trains on level tangent track continuously at 60 miles an hour.

In point of design and construction these locomotives will be of identically the same type as the former ten, having an articulated frame with guiding trucks at each end. The cab containing the engineer's compartment and that for the operating mechanism, is swung between the two parts of the frame on center pins. Each section is equipped with two four-wheel trucks having a driving motor mounted on each axle, all the axles, therefore, being driving axles. The eight motors, of the bipolar gearless type, are of the same general design as the motors on the previous 57 locomotives built for this road, and are provided with ample forced air ventilation. They are electrically connected permanently in parallel in pairs and the pairs can be connected in three combinations—series, series-parallel and parallel. They are insulted for 1,200 volts, so that if at any future time it should be desired to operate the locomotive on this voltage, the pairs of motors can be changed from parallel to series connections and the same speeds and control combinations obtained as on 600 volts.

These locomotives have greater capacity and higher efficiency than any other high speed electric locomotive ever constructed, while at the same time having lower total weight, weight per driving axle and dead weight than any other locomotive of similar capacity.

RAILWAY CONSTRUCTION IN THE CONGO.—It is reported that the preliminary work for the extension of the Elizabethville-Kambove Railway toward Bukama is now being undertaken, and that 60 miles of the new line are expected to be completed by next March. The Lower Congo-Katanga Railway, which will be 1,100 miles long, is now being surveyed, and on completion of the survey the construction work will be started. It is proposed to join the Cape to Cairo line at Bukama. The Congo-Tanganyika Railway from Kabalo to the lake is approaching completion, and only about 60 miles, for which a portion of the grading has been finished, have now to be built.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.

The twenty-fifth annual convention of the National Association of Railway Commissioners was held at Washington, D. C., in the hearing room of the Interstate Commerce Commission, October 28-31. President O. P. Gothlin, formerly of the Ohio commission, presided. Chairman E. E. Clark of the Interstate Commerce Commission delivered an address of welcome, which was published in last week's issue of the *Railway Age Gazette.*

In his address as president, Mr. Gothlin expressed the opinion that the association is not accomplishing as much as its opportunities would seem to warrant, for the reason that the members depend too much upon the committees, who present excellent reports which are not followed by action, and that these reports are frequently the work of the chairman alone. President Gothlin also suggested as a means for relieving the congested condition of the Interstate Commerce Commission's docket, that the country be divided into six districts, with a commissioner in charge of each district, the seventh commissioner to handle complaints arising from transportation involving overlapping jurisdictions.

He also took the position that regulation has done more for the railroads than for the public, and protested that no railroad, legislature or court has any right to allow higher rates to be charged at intermediate points, or non-competitive points, than at other points. He urged state commissioners to take more interest in the complaints of all shippers, even though concerning interstate commerce, and suggested that formal complaints should be abolished and that commissions hear ex parte complaints, assuming the burden of prosecuting the cases.

Commissioner C. C. McChord, of the Interstate Commerce Commission, presented the report of the Committee on Amendment of the Act to Regulate Commerce, recommending a change in section 16, to provide that complaints asking for reparation may be filed with the commission within three years, instead of two years, from the time the cause of action accrues, and also an amendment to provide that failure to post contemplated rates at the time proposed tariffs are filed with the commission shall prevent the new rates becoming effective. This was recommended on the ground that the shipping public now receives no actual notice of a change in rates until it takes effect. Chairman Clark suggested that carriers be penalized for failure to post tariffs at every station.

Clyde B. Aitchison of the Oregon commission, presented the report of the Committee on Delays Attendant upon the Enforcement of Orders of Railway Commissioners, outlying various methods for the elimination of delays, and concluding with the recommendation that the committee be abolished and its work be transferred to the Committee on Legislation. After reference to the executive committee this suggestion was adopted.

Martin S. Decker, of the New York Public Service Commission, Second district, presented the report of the Committee on Express Service and Express Rates. After emphasizing the importance of the work done by the Interstate Commerce Commission in the regulation of express matters the report suggested the need for a committee to consist of one representative from each of the state commissions, representatives of the Interstate Commerce Commission, and of the express companies to try to arrive at some working basis for the uniform adjustment of intrastate rates. The association voted to appoint a committee representing the various commissions to formulate a uniform method of stating intrastate rates.

Charles Elmquist of the Minnesota Commission presented the report of the Committee on Grade Crossings and Trespassing on Railroads, suggesting that there is more need for action than for the presentation of views. A member called attention to the campaign to bring about the enforcement of laws against trespassing now being carried on by the New York Central in New York, where thousands of arrests are being made weekly.

William Kilpatrick, secretary of the Illinois Railroad and

Warehouse Commission, and chairman of the Committee on Safety Appliances, said the committee had not had a meeting. He presented an individual discussion saying it is of vastly more importance to take steps to avert collisions and derailments than to provide steel cars to mitigate their results. He also referred to the need for the enforcement of laws to prevent trespassing, quoting statistics on the subject prepared by R. C. Richards, and declared that the most crying need at the present time is for the control of trains by an absolute space limit carefully defined by block signals, and rigidly enforced, and if necessary, further protected by an automatic train stop.

Lawton T. Hemans of the Michigan commission, presented an individual report as chairman of the Committee on Legislation, in which he said: "While there is an urgent demand on the part of the railroads that they be subjected to the regulation of one federal body and freed from the regulations emanating from 48 state bodies, still both will unquestionably remain, each satisfying a need born in the very nature of things. The legislative need of the present is the elimination of the needless, valueless, and we may say senseless conflict that exists between the states and the federal authority upon kindred phases of interstate and intrastate commerce." He recommended that appropriate action be taken by the association empowering the Committee on Legislation to confer with the Commissioners on Uniform State Laws at their next annual meeting, to the end that there may be brought about a basis of co-operation in the preparation and support of legislation affecting commerce and transportation within the various states.

On Wednesday morning, L. B. Finn, of the Kentucky commission, delivered an address on the Minnesota rate case decision, in which he vigorously opposed the idea that the federal government has power to regulate intrastate rates as soon as congress sees fit to exercise the power. He argued that it would be inexpedient to burden the federal government or the Interstate Commerce Commission with the additional duty of regulating state rates, and also discussed the legal questions at length, saying that the constitution means what the Supreme Court says it means and that the interpretation of the court is subject to change in accordance with changes in public sentiment.

John M. Eshleman, of the California commission, presented the report of the Committee on Railway Capitalization, 110 printed pages, which included a review of the various state laws dealing with railway capitalization and a large number of letters from state commissioners as to the practical working of the laws. The recommendations of the committee are summarized as follows:

We do not believe it necessary for the purposes of this paper to recommend any particular form of an act, but we do believe that we should recommend the minimum which should be provided, and this minimum we believe should be the following:

1. The limitation in the act of the purposes for which the issue of stocks and bonds shall be permitted.

2. Authority to the commissions to see to it that the proceeds of the sales of stocks and bonds are devoted to the purposes for which they are issued.

3. No stocks or bonds to be issued without the positive approval of the commission, or at least a veto power should be reposed in the commission similar to the power which the Interstate Commerce Commission has to suspend rates. If this method is pursued, the same full investigation should be required on the part of the commission in every instance, as is required when the affirmative action of the commission is provided for.

4. No limitation in the statute as to the amount for which either stocks or bonds shall be sold.

5. The power shall be reposed in the commission to impose conditions and to grant the application of the utility, either in accordance with such application or in lesser or greater amount, and to impose such other conditions as the commission shall deem necessary.

6. Regulation of the stocks and bonds of interstate common carriers to be delegated to the Interstate Commerce Commission.

Basing our recommendation upon the foregoing conclusion, your committee respectfully recommends:

That Congress immediately pass an act empowering the Interstate Commerce Commission to regulate the stocks and bonds of interstate carriers in the manner and to the extent hereinbefore outlined.

In conclusion, your committee desires to impress upon the members of this association the tremendous importance of the matter we have been here considering. The regulation of the securities of utilities, other than interstate carriers, is being handled with increasing efficiency by the various states from year to year, and the beneficial results flowing therefrom are being recognized, not only by the public as patrons of these utilities, but by the utilities themselves. In those states where most adequate regulation is now being provided, money is being invested in increasing amounts and the stability of securities is being established and healthy financial conditions are being brought about. In substantiation of this conclusion, we respectfully invite your attention to those states wherein the commissions have been given adequate and plenary authority to deal with this subject, and suggest that the members of this association consult with the representatives of the utilities from such states in the belief that such representatives will bear out the statement herein contained that from the viewpoint of the honest public utility, honest, adequate and intelligent regulation is a good thing.

In the case of the interstate carrier, however, by reason of the facts hereinbefore referred to, it is possible for the various states to regulate, and the federal government should not lag behind in this field wherein it alone is competent to act.

Most of the Wednesday afternoon session was devoted to a discussion of the report on capitalization, at the conclusion of which the recommendations were endorsed by the association with the exception of the fourth, providing for "no limitation as to the amount for which stock or bonds shall be sold."

On Thursday, Milo R. Maltbie, of New York, presented the report of the Committee on Railroad Taxes and Plans for Ascertaining the Fair Valuation of Railroad Property. This consisted of a series of special papers as follows:

A Just and Scientific Basis for the Establishment of Public Utility Rates, with Particular Attention to Land Values, by Commissioner Max Thelen of California. Discussed by Commissioner Clifford Thorne of Iowa.

Elements of Appreciation in Railroad Valuations, by Commissioner George A. Henshaw of Oklahoma.

Accounting Side of Rate Making, by Dr. E. W. Bemis of Chicago. Discussed by Commissioner R. Hudson Burr of Florida.

Depreciation and Its Relation to Fair Value, by Dr. A. F. Weber, Chief Statistician of New York, Public Service Commission, First District.

Valuation of Property Constructed from Surplus Earnings, by Commissioner Forest E. Barker of Massachusetts. Discussed by Commissioner W. M. Daniels of New Jersey.

On motion of Commissioner Thorne of Iowa a resolution was adopted providing for the appointment by the president of the association of a committee of 15 to co-operate with the Interstate Commerce Commission in making the valuation of railway property.

Mr. Klapp, of the Wisconsin Demurrage Bureau, presented a paper on Demurrage as a Measure of Relief from Car Shortage, in which he showed that car capacity has increased 69.22 per cent., locomotive tractive power 109.5 per cent., and ton-miles only 28 per cent. He suggested that increased terminal facilities have offered greater opportunity for storage by the shippers rather than assisted prompt unloading and that relief can be found in higher demurrage rates which will make it more economical for the business man to store his own goods than to pay the carrier for doing it for him.

B. H. Meyer, of the Interstate Commerce Commission, presented the report of the Committee on Statistics and Accounts, urging that greater attention be devoted by the railways to the assignment of expenses as between freight and passenger service. The report stated that so many roads are now assigning many of their expenses that it would seem to be possible to obtain far more accurate cost data than are now available. In discussing the paper Commissioner Clark said there is urgent necessity for the adoption of a uniform method of reporting loss and damage claims.

Clifford Thorne, of the Iowa commission, presented the report of the Committee on Uniform Classification and Simplification of Tariff Sheets, which, after reviewing the history of the agitation for uniform classification, concluded with a recommendation "that there should be appropriate legislation by congress, authorizing and directing the Interstate Commerce Commission, assisted by a body of disinterested experts appointed

by the commission, and paid by the federal government, to frame and promulgate a classification of freight to apply uniformly over the United States."

James E. Sague, of the New York (Second district) commission, presented the report of the Committee on Rails and Equipment, which included a general discussion of rails, speed recorders and steel cars, supplementary to the committee's report of last year.

The following officers were elected for the ensuing year: President, Lawrence B. Finn, of Kentucky; first vice-president, Clifford Thorne, of Iowa; second vice-president, Robert R. Prentis, of Virginia; secretary, William H. Connolly, Washington, D. C.; assistant secretary, William Kilpatrick, of Illinois.

The next convention will be held at Washington on November 17, 1914.

At the suggestion of Commissioner Marble the constitution was amended to make the Canadian Board of Railway Commissioners eligible to membership in the association.

LEGISLATION AFFECTING THE TIME AND MANNER OF PAYMENT OF RAILROAD WAGES.

BY ARTHUR B. JONES,
Local Treasurer, Chicago & North Western Railway.

Various states of the Union have passed laws governing the time and manner of payment of employees, and various other states have had before their legislatures bills of like nature. I will endeavor to state the nature and extent of this legislation, passed or proposed; to indicate the cost to comply therewith; will state what I believe to be the reasons which brought on such legislation; will contend that these laws, instead of being in the interest of the employee, are detrimental to him, as well as to the companies; and will make a plea for an earnest effort to stop their spread and to abolish the laws already passed.

The fashion started in the East, some New England states having had such laws for some years; other eastern states, including New York, having had them for six years. During the last legislative sessions they spread through Pennsylvania, Ohio, Indiana, Michigan and Illinois. Very few states west of Chicago have such laws, but bills have been introduced in many of their legislatures, more of them this year than ever before, but, with the exception of Illinois and Michigan, none were passed.

Some of the laws govern not only the time of payment, but prescribe that payment be made in currency. Some require two payments, others four payments, a month, and as early as 10 days after the close of the period, while others allow as much as 18 days. Bills that failed of passage varied much; some requiring currency payments, some payment by bearer check and within three days after the close of the period.

The financial burden to railway companies in complying with such legislation is of much interest to railway managers and owners. The cost to keep the time, compute the wages and pay a railway employee once a month by check (the cost in currency is considerably larger) is approximately 20 cents, and to pay him twice a month, the cost, while not double, is increased by 60 per cent., or 12 cents. This means that the cost to the railroads of the State of Illinois, due to the recently passed law, runs to a total of $220,000 per year, and if the law spreads only to the northwestern states, traversed by the lines of the company I represent, the increased annual cost to the roads operating in those states will total $700,000. If applied to the whole country, it totals $2,125,000 a year.

The above does not cover many indirect costs, hardly ascertainable, but just as real nevertheless—such as the distribution of checks; the loss of the company's time in the employees procuring their checks, and the cashing of them, together with the labor of agents in cashing large numbers of them; and the risk of other losses which always accompany cash transactions. Payday breaks into the routine and efficiency of all, not only at the time of disbursement, but in all things directly or indirectly affecting the payrolls. Operating officers must necessarily give much attention to matters concerning the payment of wages, and this impairment of their efficiency should be sufficient in itself to defeat such bills.

Like many such laws, these are much more far-reaching than the objects which they presumably seek to effect, for they involve the upsetting of economic practices, commercial and domestic, which experience has proven to be sound and to most nearly meet the requirements of all.

The amount a railway expends for labor forms such a large part of its total disbursements that the duty of paying the large forces, scattered, moving about, working under different departments and with varying rates, rules and conditions, is one of great responsibility and harassment. To compute the time and determine each man's due and pay him, is only accomplished through a carefully devised system—the result of years of practical experience. It is designed to secure for the employee all he has earned and to protect the companies against loss. Few of the problems enumerated above enter into wage disbursements as applied to other lines of business, and this fact furnishes a valid reason why railways should not be included in such legislation, if, indeed, any legislation on the subject is desirable.

Notwithstanding the cost, direct and indirect, such legislation might be wise if it brought the employee a single benefit. On the contrary, however, the country over, practically all obligations are adjusted to a monthly settlement, and, therefore, the monthly payment of wage more nearly meets the requirements of employees, for their obligations, such as rents, store bills, etc., mature monthly, and this enables them and their families to effect the settlement of their debts at one time. The more one studies the effects of such laws, the more he is impressed with their harmfulness to employees, for they enter vitally into the home economy and affairs. Being paid so often, little is owing to the employees at any time, and the basis for the establishing of a financial credit is therefore impaired. Many go from hand to mouth, trusted by nobody, some demoralized, being required, in order to pay monthly accounts, such as rents, to husband their money until such accounts are due—a difficult task for anyone. The frequent payment promotes improvidence, and those who are extravagant and inclined to wrong-doing might follow their bent with greater ease, being harmed financially and morally. I am assured by a number of large employers of men operating in various parts of our country that nowhere is it so difficult to get competent and reliable men as in those states where as many as four payments a month are required by law.

The essential things are that the employee knows exactly when payment will be made, and that it be made as early after the close of the month as is practicable. Railway payments never vary a day from month to month, and the employees can confidently look forward to a particular day when their pay will be received, and enable them to cancel their obligations and add to their savings. Railroad men of all classes, because of the certainty and regularity of their pay, have less trouble than others in getting credit for the needs of life, and, moreover, the railways' general practice is to honor hotel and boarding-house bills when necessary to employees. Discharged men are paid promptly upon leaving the work, and payments are made in advance in cases of sickness, death or other emergencies, no employee being compelled to suffer in the slightest degree because he cannot get his money oftener than once a month.

While we may not all agree as to the relative merits of payment in currency and payment by check, we will agree that those companies which find that payment by check more nearly meets the circumstances which surround them should not be arbitrarily required to change. The subject of currency payments, as against the check system, is a large one, and as I see

it, there is much to be said against currency, both from the standpoints of expense and risk, but our company follows both systems, for we find conditions, even on our own lines, vary enough to dictate this, and this strengthens my conviction that railway officers should be left free to solve such problems by applying their own ample experience and commercial prudence.

It is understood that the earliest of these laws, as for instance in New York, were suggested by the tradesmen, hoping that it would enable prompter payment of accounts by employees, which hopes, by the way, have not been realized, but, on the contrary, the opposite effect has been experienced. It will be noted that the laws spread from one state to its neighbor, and this is due to the fact that, as operating divisions overlap from one state to another, employees receiving their pay once a month feared they were losing an advantage that those in the next state enjoyed.

I have faith, however, in our ability to prevent the spread of this wage-payment legislation, and it is pinned to my belief that the employees, at least in our northwestern district, will never again send representatives to the legislatures for such legislation, as they will realize that no benefit comes to them, and that the large cost, coming from the treasuries of their own companies, will, to just that extent, lessen the ability of their companies to spend money in ways that really benefit them. I believe that they are beginning to see the lack of wisdom of advocating legislation of any kind that is burdensome and detrimental to the interests of their companies; that they realize that the interests of the employees are wrapped up in the success of the companies; and that any move which hurts the companies hurts them. During the next two years I hope that there will be collected such data as actual experience brings forth, to aid in proving that an often payment of wages is unwise for all concerned.

THE NEED FOR HIGHER RATES.*

By B. A. Worthington,
President, Chicago & Alton.

In the early summer months of the prevailing commercial activity, an imminent danger was sighted; and a note of warning was sounded. Weaknesses were evident in the financial structure supporting the railroad situation. What have we done to remedy this condition? Nothing! Have we lightened the load which commerce shall carry over this structure? No, that is a practical impossibility! Have we used common business prudence in ignoring these conditions? How long may we expect to maintain the poise of commercial supremacy, standing upon unstable fundamental conditions, eagerly reaching for the greater load so temptingly offered by progress and advancement?

The weakness of the future is the weakness of today, and it is a crime against reason to ignore it. And while expressions of sympathy are offered and are accepted in good faith, more substantial and enduring support is necessary. Our physical ailment does not respond to Christian Science treatment, and the quackery of legislation is nauseating.

No better evidence of the decline in railroad prosperity can be adduced than the comparative composite statement of the income accounts of a number of important common carriers in the state of Illinois, including the Wabash, Chicago & Eastern Illinois, Big Four, Illinois Central, Chicago, Peoria & St. Louis, Toledo, Peoria & Western, Lake Erie & Western, Toledo, St. Louis & Western, Cincinnati, Hamilton & Dayton, Vandalia, Peoria & Eastern, Chicago, Terre Haute & South Eastern, Chicago, Indiana & Southern, and Chicago & Alton; fourteen railroad systems invaluable to commerce as agencies of concentration and distribution, particularly to the State of Illinois, more particularly to the Central Manufacturing District of Chicago.

	Fiscal Years.		Increase or Decrease.		
	1908.	1913.			Per Ct.
Operating revenues	$160,664,617	$206,172,785	Inc.	$45,508,168	28.3
Operating expenses	118,257,987	162,078,777	Inc.	43,820,790	37.0
Net operating revenues	42,406,630	44,094,008	Inc.	1,687,378	4.0
Operating ratio	73.6 per cent.	78.6 per cent.		.....	....
Taxes	$5,705,564	$7,940,289	Inc.	2,234,725	29.1
Net corporate income	10,843,704	4,753,493	Dec.	6,090,211	56.2

*Extract from a recent address before the Central Manufacturing District Club of Chicago.

The year 1908 was a panic year. The year 1907 and other years prior to 1908 were better than 1908.

Net after taxes in 1912 and 1913 were smaller than in any previous years.

Taxes increased $1,000,000 from 1911 to 1913.

Net corporate income, after deductions, shows that these fourteen railroads had $16,155,624 to apply to dividends in 1910; only $4,193,877 in 1912; and only $4,753,493 in 1913.

Net corporate income shows a decrease of 56.2 per cent. since 1908; in other words, decreasing twice as rapidly as total operating revenues are increasing; i. e.:

Total operating revenues.....increased 28.3 per cent.
Net corporate income.....decreased 56.2 per cent.

Deductions from income have increased due to an increase of almost $130,000,000 in new capital put into additions and betterments, and to the increase in rates of interest which the railroads have to pay.

In dealing with the matter of railroad regulation, more particularly with the matter of rate limitations, it is customary with commissions and legislatures to attach marked significance to the continually increasing gross earnings of the railroads, the inference being that gross earnings constitute a fairly reliable index to the financial results of operation.

Not only is this theory entirely wrong, but the premises upon which it is based are unsound. Not only has revenue per unit of service decreased very rapidly in recent years, but expenses have increased in even greater ratio—a two-edged sword that destroys the theory of gross earnings representing an accurate barometer of railroad prosperity.

To illustrate concretely what this means in dollars and cents, I have only to cite the current earnings of three of the greatest railroad systems in the world—the New York Central Lines, the Pennsylvania System, and the Southern Pacific Company.

The July statement of earnings and expenses of the New York Central Lines, recently published, shows:

Total operating revenues.....increased $2,328,988—10 per cent.
Total operating expenses.....increased 3,239,970—19 per cent.
Net operating revenues.....*decreased* $910,982—15 per cent.

For the same month the Pennsylvania System published the following statement:

Total operating revenues.....increased $1,995,053— 6 per cent.
Total operating expenses and taxes.....increased 2,727,745—19 per cent.
Net operating income.....*decreased* $732,745— 8 per cent.

And the Southern Pacific Company reports:

Gross revenue .....decreased $1,380—1-100 per cent.
Operating expenses and taxes.....increased 784,803—14 per cent.
Revenue over expenses and taxes.....*decreased* $786,183—19 per cent.

Here are two instances wherein total operating revenues increased very substantially, but net decreased in a much greater ratio; in the latter instance, with approximately the same gross revenue, an alarming decrease in net after deducting operating expenses and taxes, is shown.

I call your particular attention to the fact that these are the current results of operation of three of the foremost and most progressive railroads in America, at the present time enjoying the heaviest volume of traffic in their histories. And, incidentally, I venture the question—what can be expected of the weaker lines? And what may be expected of even these strong lines themselves in a period of adversity which is sure to come and which, in its very nature, will take away the remedy now at hand?

While these figures in themselves are convincing that gross earnings do not constitute a reliable index to the financial results of operation of railroad properties, as you are aware they do not include fixed charges; the higher rates of interest now demanded on railroad bonds and notes; and the prohibitive rates for new capital necessary for improvements to handle

economically the volume of traffic that is now moving, and the prospective traffic of the future, are factors which will influence the results of operation for years to come.

You will all remember the panic year of 1908, following the exceptionally prosperous business year of 1907; and as business depression is likely to come upon us at any time in this country under present business methods, it occurred to me that it might be interesting for you to note what would have been the effect, had the year 1913, following the fairly good business year 1912, suffered a business depression corresponding with the depression of 1908. By applying to the results of operation in the year 1912, the same ratios of decreases as in 1908 compared with 1907, eleven important railroads operating in the central west would show the following decreases in 1913:

Total operating revenues	decrease	$28,091,581	5.2 per cent.
Total operating expenses	decrease	6,992,276	1.8 per cent.
Net operating revenues	decrease	$21,099,305	34.6 per cent.

Considering the railroads included in the foregoing comparison individually, four of the lines would show deficits in net corporate income ranging from $300,000 to $3,850,000; three of the lines would show comparatively small margins of surplus under net corporate income, ranging from $336,000 to $682,000; there being only four of the larger and stronger railway systems that would be able to maintain a sufficient surplus to insure stable financial conditions, even during a depression of one year's duration, and a continuation of such adverse conditions would no doubt produce more disastrous results.

This takes no account of the continually increasing taxes and fixed charges; nor is there any substantial assurance at hand that a recurrence of the 1907 panic is impossible or even improbable. Apparently we have averted a panic this fall—or, have we only postponed it after all? Have we been treating the *cause* of the trouble, or only a *symptom?* Have we eradicated the cancer or have we only chloroformed the patient?

Time will tell—time is telling.

It is extremely urgent that commerce should recognize these conditions and display some activity to relieve the situation. Kind words of sympathy are not out of place at a funeral, but sympathy is a poor substitute for nourishment; and what the railroads need now *is* nourishment—in the shape of increased freight rates and it is up to the manufacturing interests of Chicago, as a matter of self-defense, to take the lead in fighting for this cause.

The disregard and contempt displayed by the makers of our laws for the knowledge and experience of thousands of trained experts in railroad matters, and the extravagant recklessness and utter foolishness in tampering with the most delicate and evenly balanced machinery of commerce, are serious matters which call for prompt and heroic treatment, and nothing can be as effective as a serious, conscientious and persistent protest on the part of the shipping interests of the central manufacturing dis- liberally discounted in legislative matters, the railroads are at the mercy of an unsympathetic public, bound and gagged with legislation and plucked to a finish by the harpies of politics.

In this connection it might be well to look back to the early days of railroading—wherever we may look we find the railroads nursing industry, defending industry with every means at their command—lawful or unlawful, the *railroads defended industry,* for the railroads always have recognized that industry is indispensable to successful railroad operation. In many instances, we find that the railroads donated building sites, and transported building materials, either free of charge or at a nominal cost. The old-time rate wars, destructive to the railroads themselves, were sacrifices to industry.

The acute business instincts which prompted the railroads to accept the dangers incident to their pioneering work of development, were always sounding the future. The railroads anchored their lines with industries and pushed on farther and farther into the wilderness, always looking to the future for reward. Profits, so called, lay far beyond the span of life of the great men who undertook this hazardous work in the interest of civilization; they responded to a mightier cause, and bequeathed to us the legacy of their efforts—the railroads and the industries which the railroads have encouraged and protected always—the elements of peace, happiness and contentment. However, changed business conditions have come about—purely and simply through the efforts of the railroads to protect industry.

Discrimination, manifestly an unfair instrument of protection but a perfectly natural weapon in the early pioneering days, has been condemned; discretion is indicted and held as an accomplice. The fine economic poise of commercial conditions, ever changing and shifting to meet the varying needs of industry, hitherto has been established automatically by freight rates which maintained more or less definitely a perfectly natural balance in commercial relations. In the nature of things this compensating influence, the most delicate and perfect, withal the most potent regulating influence, cannot be fixed permanently and arbitrarily without immediately disrupting and finally wrecking the entire machinery of commerce itself. We are straining here and there, some pieces of this vast machinery already are broken, and it is the sheerest nonsense imaginable to further withhold the relief that is now within our hands. A recurrence of the panicky conditions of 1907 or a serious stringency in the money market under present conditions, without doubt, would remove the remedy forever.

With the public clamoring for steel passenger train equipment, the government heading the procession with mandatory orders for steel postal cars regardless of everything else; the public still further demanding new, elaborate and exceedingly expensive passenger stations, not only at Chicago and Kansas City, but at many other points, none of which means additional revenue—only additional expense; also demanding and enforcing the elimination of grade crossings, and innumerable useless and impracticable "improvements"—it is a plain case of "money down and hands up" inconsistent with either justice or common sense.

Measured with the hazards undertaken and the industrial development induced, railroad securities should be free from disturbing influences of this kind. By all means railroad bonds should be as safe investment as government bonds, for the physical property of the railroads constitutes the underlying value of government bonds. It is a parody on business methods to tamper with a security of this kind. Withdraw the railroads, and all that they imply, and government bonds would represent an entirely fictitious value, a wealth of the nation that would be wealth unavailable. And to the extent that these artificial measures are restricting railroad development, we *are* withdrawing the railroads as a tangible security of national prosperity.

In 1910, 33.29 per cent. of the stocks of railroads operated in the United States had never paid a dividend, yet these railroads are invaluable to the thousands upon thousands of persons they serve. Surely there is no sound reason for making the conditions of operation so onerous and burdensome as to crowd out many of these lines serving territory where traffic is light. Every one of these lines should be protected, should be enabled to maintain the physical condition of such property at a high standard of efficiency, yield to capital invested in such stocks a fair return commensurate with the hazards undertaken and development created, and, further, to provide from operation a surplus to guard against reverses of the future.

Railroad stocks, however, are delivered by legislative enactment to the tender mercies of the pirates of labor and the sharks of finance—weather vanes of speculative sentiment, responding to the hot breath of summer and the cold blasts of winter. Railroad capital is reduced to a beggar at the doors of justice.

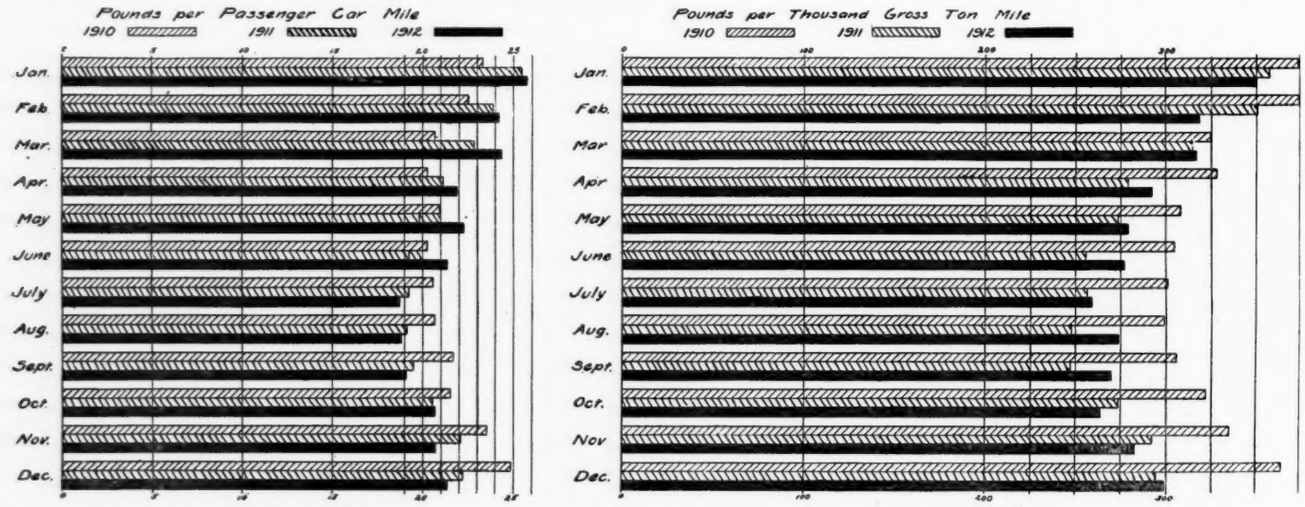
All this is arbitrary, unnatural and fraught with grave dangers. With reasonable rates for service performed (which is all that is asked, and all that is wanted), railroad property could be maintained at a high standard of efficiency, railroad securities no longer would be financial traps in the hands of wily speculators, but savings banks—anchors of the nation, and the impetus to industry that would be afforded by permitting the railroads to supply current necessities, would be nothing short of wonderful.

LOCOMOTIVE FUEL ECONOMY ON THE FRISCO.*

Systematic Attention Given This Important Subject and Cooperation Emphasized as Necessary to Obtain Results.

By Robert Collett,
Superintendent of Locomotive Fuel Service, Frisco Lines.

During 1912 there were 236,444 miles of railroads in the United States and the cost of fuel for operating trains over them was $230,555,544, or 11.85 per cent. of the total operating cost, and 8.22 per cent. of the gross earnings; a cost of about 4,000 per year for each locomotive in service. In the past two years there has been a considerable increase in the unit cost of fuel, and this has further increased the ratio of fuel expense to the gross earnings. Railroad managers are therefore very much interested in keeping the cost to the lowest possible figure; and when purchasing new locomotives or overhauling engines in service, consideration is given to equipping them for the greatest economy in the use of fuel. Appliances of whatever nature, unless properly looked after, do not produce results, and it, therefore, resolves itself largely into the matter of the human element. A crew should not be sent out in charge of a $20,000 locomotive with $30 or $40 worth of coal in the tank, and access to that much more, if required on the trip, without feeling a personal responsibility in the care of the engine and supplies, and there should be some way of determining whether or not proper efficiency is obtained.



Fuel Used per Passenger Car Mile in Passenger Service and per 1000 Gross Ton-Mile in Freight Service.

At the close of the year 1910, a plan was originated by W. C. Nixon, vice-president in charge of operation of the Frisco Lines, to look into the matter of locomotive fuel economy. Briefly, the plan was to undertake to find out what we were doing in the use of locomotive fuel and what we might reasonably expect to do and how to do it. Some of the items given special emphasis by Mr. Nixon were:

Waste of fuel because of engines delayed on the road.
Engines kept under steam unnecessarily at roundhouses.
Improper handling of engines.
Excessive use of fuel by firemen.
Engines not in good condition.
Fuel not up to contract specifications.
Shortage of coal before reaching the pockets.
Fuel used for other purposes and improperly charged to engine use.
Performance sheet to be made by engines, so that the result of each trip would be shown in a statement by days in order that an abnormal amount of fuel used on any one trip or day could be determined.
Any other matters that may require attention.

This plan was put into effect the latter part of December, 1910, and at first was confined to one division; by the close of the year 1911 it was in effect on all divisions. A record is kept by charging the amount of fuel used by each engine in moving over the division on each trip against the gross ton miles in freight service, and passenger car miles in passenger service, for that particular trip, the work being entirely independent of the fuel department or mechanical department. The result of the effort made in the direction of fuel economy on the St. Louis & San Francisco in passenger and freight service for the calendar years 1911 and 1912, compared with 1910, is shown in the attached statement. This statement is predicated on the pounds of fuel used per 1,000 gross ton miles in freight service and pounds per passenger car mile in passenger service—the accumulative saving is figured on cost of fuel exclusive of cost of transporting it over our own lines; neither does it include the expense of handling, and does not include switch and work service. This statement was made primarily to show the enginemen and all others concerned the progress that was being made. Necessarily any saving in the volume of fuel used will reflect a further decrease in operating costs incident to the smaller volume of company material (which in this case is cars of company coal or oil) that must be moved without revenue return.

The very severe winter and its effect on the motive power and the road bed, the Mississippi valley floods in the spring and the suspension of the mines, with necessity for storing coal on our line, made 1912 scarcely a comparative year with 1911. In January, February and March, 1912, the Mississippi valley in particular experienced several severe snow blockades. How this affected the operation of trains is evidenced to some extent by the double-head mileage necessary to keep passenger trains running. In the three months mentioned the St. Louis & San Francisco ran 70,401 miles of double-headed passenger trains as compared with 19,129 miles in the same three months of 1911, an increase of 51,272 miles.

The theory of the Frisco fuel service is to get away from the report of the individual crews, because it is believed that such reports frequently result in sharp practice and may not reflect true conditions, whereas, if a report for engines is made and an engine is not in proper condition, it remains for the mechanical department to correct the defects; if due to improper operation on the part of the crew, it is for the division officers to see that

*Abstract of a paper presented before the St. Louis Railway Club at the May meeting.

they are properly instructed. Test trips were made by riding engines just as they were turned out for service, to determine the actual amount of fuel used, and although an engine might steam well, if it burned an unnecessary amount of fuel, the cause was investigated.

These trips showed the necessity for establishing standards of efficiency. An engine may show a very good performance from a train handling standpoint and still be making a very poor fuel performance. A great many tests have been made on every division, after having gone over the engines to see that all of the details that would affect the fuel performance were as nearly correct as possible, such as the condition of valves, cylinder packing, air admission through grate and ash pan, size of exhaust nozzle, size of injector, and in fact every feature that would improve the performance of the engine. Standards of fuel consumption have thus been established, and standards for draft arrangements for each class of engines have been decided on as being the most practical for the various operating conditions under which the engines work. The average performance of the engines in service will exceed the test figures, but the test figures show what the locomotive is capable of doing and furnish a standard to work to.

I will now take up the various items outlined above:

"Waste of fuel by reason of unnecessary delay on the road." The fact that all concerned know that the management is closely observing the fuel cost, results in trainmen and enginemen calling attention to delays, and individual cases are followed up to prevent a recurrence.

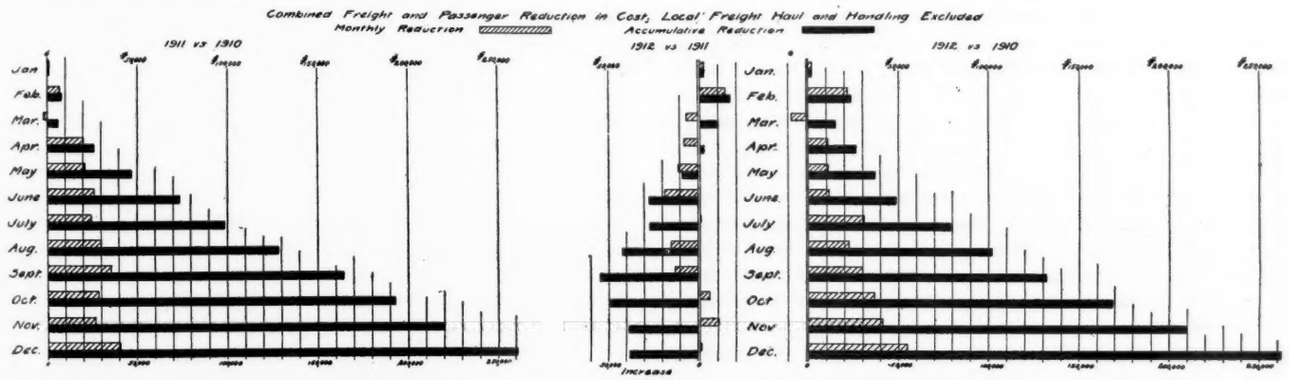
"Engines kept under steam an unnecessary length of time at the roundhouse." Lack of facilities will sometimes cause a waste of fuel in this respect. However, there is apt to be a tendency to put the burden of responsibility on the roundhouse foreman, requiring him to keep engines ready at all times. This was handled by establishing a rule that the transportation department will furnish the mechanical department three hours' notice before the engine will be required for service, and as nearly as practical this rule is observed.

A report is made showing how much fuel is burned at each terminal by engines standing under steam for more than three hours, and a statement of the cost is submitteed to each division superintendent at the close of the month. On short divisions, in passenger service, the amount of fuel consumed at the terminals may easily equal 20 per cent. of the entire fuel used by the locomotives. On a number of divisions the passenger engines are now run over two freight divisions. At Newburg, Mo., an intermediate freight terminal located between Springfield and St. Louis, the fires are not cleaned on passenger engines; we simply clean the ash pan and bank the fire, the engine taking the next passenger train forward.

"Excessive use of fuel by firemen and improper handling of engines." Proper results in the management of engines can only be obtained by first-class team work on the part of engineers and firemen. Before commenting on the work of the crew, I wish to say something about the man who has supervision over the crews. He has been selected for the position because he is a skillful engineman. He derives benefit from observing the work of all the crews and should know the best methods of handling and firing the different classes of engines, and should be able to impart this information to others in such a way as to not give offense. He should possess a good disposition and at least two suits of overclothes, and if he is to obtain proper results in fuel economy he must have time to get out on the line with the crews. It is, of course, necessary to spend some time in the terminals, but his time should not be so taken up with other duties that he will not have ample time to follow the work of the crews on his division and also note the result of changes that have been made on the locomotive or appliances that have been put on which are intended to improve the performance of the engine. The assistant superintendent of locomotive fuel service, who formerly held the title of road foreman of equipment, is in charge of the fuel economy work on his division and is a member of the superintendent's staff. He is entirely independent of the fuel department or mechanical department, although, of course, his work is almost entirely in connection with the work of these departments. He watches the tonnage rating, to see that the engines get the most uniform loading possible, the maintenance of draft appliances in the condition found by tests to be the most efficient and economical, and conducts all of the progressive examinations of firemen and assists the master mechanic in looking after the general care of the engines and their operation by the engine crews.

In the management of the engine there are not a dozen different correct ways to run and fire it. There is one best way to handle each class of engine, and he should know that way and let the others know it and ride with the crews often enough to know that they do their work in the proper manner.

The engineer who makes the best fuel performance pays particular attention to a number of things. He knows what the condition of the fire is when he pulls away from the terminal, and handles the engine accordingly. He does not slip the drivers if it can be avoided, or tear holes in the fire. He opens the cylinder cocks as soon as circumstances permit and relieves the condensation, thereby avoiding damage to the pistons or cylinders or of washing lubricants off the cylinder walls and valve seats. He starts the lubricator early enough to have the cylinders and valves well oiled before starting the train and feeds both sides alike and regularly. He does not change the reverse lever from full stroke to the final cut-off in one or two movements, but shortens the cut-off gradually as the speed increases and handles both the reverse lever and the throttle so that, especially on slide valve engines, the steam chest pressure does not back up into the oil pipes and retard lubrication. He works steam as expansively as consistent with good lubrication, schedule and general condition of the valve gear, and this without particular reference to the perpendicular position or angle of the reverse lever. The injector is handled so as not to over-supply the boiler with water, requiring that the injector be shut off on account of too much water, nor does he allow the fireman to do so when



Showing Fuel Saving Accomplished on the Frisco During the Past Three Years.

he is pumping the engine. He understands the language of the locomotive and can feel its pulse without the necessity of a certain amount of noise at the stack, provided the engine will do its work without such noise. The running time is used between stations and the movement kept as continuous as possible. The result of his observations and opinions are responsible for the engines having been equipped with the present modern type of quadrant and reverse lever and throttle, as well as other devices that will permit of the engine being operated skillfully, and he utilizes them to the best possible advantage and at the completion of his trip reports the items that are needed to be done to maintain or improve the engine's efficiency. A careful crew, working together, can do more to establish a proper fuel performance than all the devices known.

"The firemen's duties." The first thing, of course, is to start firemen out right when employing them. Formerly, in putting on new firemen, we gave them a student letter, to be endorsed by three engineers with whom they had ridden. There was a tendency for them to ride with the engineers who they thought would endorse their letter, or firemen with whom they were acquainted, although these engineers and firemen might not be the most skillful men. We now tell the student firemen who to ride with, and before accepting service they are interviewed by the assistant superintendent of locomotive fuel service, who either approves or rejects their application.

We try to anticipate the need for firemen and to have desirable men in view of these positions.

For the men already in service, we have a first, second and third year's progressive examination. The knowledge gained through discussion and study is reflected in the work of the firemen. It is natural that a fireman, having told the instructor the proper way to fire an engine, will endeavor to carry out this practice.

In making trips over the divisions where the performance is particularly good, a record is made of the trip by the assistant superintendent of locomotive fuel service. A copy of this record is sent to the division superintendent and the crews are given credit for skillful operation. A copy of this letter and record of the trip is frequently attached to the personal record of the crew.

We try to impress on the firemen that we want them to do their work in the easiest way, which is by carefully preparing the fire at the terminals, firing light and often, and keeping the fire as clean as possible. The instructions to the fireman are made so that the engineer will be agreeable to them and have them carried out when we are not on the engine. At best, we can be with one crew only a small part of the time, and it is largely the personal pride they take in their work that counts. If one crew can handle a seven-car, all-steel passenger train over a division of 119 miles and not take water over the entire division; another crew handle a local passenger train of seven cars over a 286-mile division and only take water twice, with a tank of 7,000 gals. capacity; or another engineer and fireman with a freight engine handle 90 per cent. of the engine's potential rating and run 97 miles between water tank stops, it indicates that a first class fuel performance is being made and that the engine is in first class condition; that the work is less arduous for the fireman than if the opposite were true, and it further indicates that we should try to bring the other engines and crews as nearly as possible up to this standard of efficiency. I do not mean by this that they should necessarily make the same run between water tanks, but such performance shows that neither fuel nor water had been wasted.

"Engines not in good condition." One of the most important factors in fuel economy is the conditions of the engines. It is essential that draft appliances be maintained to standard; that is, as nearly as possible to what is found to be the correct dimensions for the different classes of engines, and if an engine does not steam freely, the trouble should be looked for elsewhere. If the engine burns a level fire and the proper location of petticoat pipe and draft sheet has been determined for this class of engine, there is very little gain by moving the petticoat pipe up or down, or changing the draft sheet; there is more likely to be a leak in the steam pipes or the exhaust joints. The first thing to ascertain is whether the flues are thoroughly clean, and whether there are any holes in the grates around the grate bearing bars or dump grates, and if there is plenty of air opening in the ash pan. If these items are found to be correct, a water test should be put on the steam and exhaust pipes. A very prevalent cause for the waste of fuel is that of reducing the nozzles. The engineer may report on the work book "Reduce nozzle; engine is not hard enough on fire." This is sometimes done at the suggestion of the fireman after the fire has become clinkered. There may be several causes entirely apart from the nozzle, such as the flues leaking or stopped up, the netting stopped up, a leak in the firebox or smoke arch, improper running or firing, or a number of other causes, and with the defect remedied, there would be no necessity for reducing the nozzle. But if nozzles are allowed to be reduced indiscriminately, it is probable that some other defects at least may not be corrected. The contracting of the nozzle calls for a heavier fire to be carried on the engine than on other engines of the same class and may result in the fireman firing engines that have not had the nozzle reduced, heavier than is required, with the result that another fire is spoiled and another engine is reported not steaming. We record the size of the nozzles on the monthly engine condition report. In the roundhouse we keep a board, slotted so as to straddle the bridge, and we put this down in the nozzle without opening the front end and thus check the actual measurements with the measurements reported.

Tests conducted by the Santa Fe show that engines equipped with a nozzle as large as is used on the average railroad have a back pressure in the cylinders, at times, equal to the pull at the draw-bar, which means that as much of the power of the locomotive is used in creating draft under these conditions as is used in pulling the train. From this the premium that is paid for contracting nozzles unnecessarily, or neglecting to clean them out, is readily seen; this feature should not be left to the discretion of some one in the roundhouse that would prefer to contract the nozzles rather than go after the real cause of the trouble. With us the nozzles are not reduced without the consent of the master mechanic and assistant superintendent of locomotive fuel service.

Another cause for the waste of fuel lies in valves so set that engines cannot be worked with the most economical cut-off. We found this was especially apt to occur on large freight engines equipped with slide valves. Unless this is specialized on and tests are made to show the difference in the fuel consumption of an engine working at a long stroke, or in close cut-off, the shops may not be particular to set valves so that the engines can be worked properly. On one division it was found by marking the cut-off on the quadrant, that the minimum point at which the engine could be worked was frequently not closer than 11 in. or 12 in. on slide valve engines having 22 in. x 30 in. cylinders. The valves were then squared up to work at any point of cut-off and it was found that the 5-in. notch was the most desirable minimum cut-off for this class engine. Quadrants have been similarly stenciled on one or two engines of nearly every class.

Our mechanical people try to make things as convenient as they can on the engines and are very appreciative of suggestions. Enginemen themselves are continually making suggestions that help the fuel performance, and we try to carry them out whenever practical.

"Fuel not up to contract grade." The assistant superintendents of locomotive fuel service inform themselves as to the contract grade of fuel used on their divisions and learn something of the accounting of fuel. They occasionally visit the mines and notice the quality of the coal as it is loaded. Our fuel department maintains a very close inspection at the mines on the quality of coal and distributes it to burn one grade of fuel on each division where it is possible to do so. Since the fuel economy department was established, we have made tests and certain changes in the distribution with good results.

"Shortage of coal reaching pockets." Aside from pilfering,

or coal that may be taken for cabooses from the cars of coal intended for locomotive use (and which has always been provided for by the fuel department by charging to each caboose in service an amount shown by test to be approximately correct, crediting locomotives with this amount), this is simply a matter of securing correct weights and is closely looked after by our weighing bureau and the fuel department.

"Fuel used for other purposes and improperly charged to engine use." This item refers to the incorrect distribution of fuel primarily charged to locomotives, but which is diverted at roundhouses, shops and elsewhere for miscellaneous purposes.

A careful canvass of such divertments was made over the entire line and steps taken to see that the proper transportation, roadway or shop account was charged with the fuel consumed by it, and proper credit, in return, given the open fuel account, thus relieving the locomotives of a miscellaneous tonnage that they did not consume. While such mischarging did not occur on our lines to any material extent, unless watched continuously, a mishandling of this character is liable to creep in with resultant disadvantage to the locomotive fuel performance.

By co-operating with the fuel and special service departments we have practically overcome the pilfering of coal. This is a public evil that is probably not thoroughly appreciated. We should try to disabuse the mind of the trespassing public of the idea that coal in transit or standing in railroad yards or even on the ground at coaling stations is nobody's or everybody's property. This applies to commercial as well as to railroad shipments.

To establish a proper fuel performance sheet, much depends upon the correctness of the daily coal report furnished from the coaling stations. This is apt to be lost sight of. It is a simple report to make out, but it is very necessary that close attention be given it to secure accurate figures, representing the actual amount of coal given to each engine. When visiting terminals, the assistant superintendents of locomotive fuel service check up a great many things from a fuel standpoint and give special attention to the end that engines are charged with the exact amount of coal they receive.

It is very important also that engineers familiarize themselves with the amount of fuel required to fill a tank and make out tickets for the exact amount ordered, for in the event of taking coal from connecting lines or mine tipples on the line, the engineers are, in a way, the purchasing agents of the company they represent.

We feel that we gain a great deal by making a daily performance sheet. While varying conditions will cause engines to burn more fuel one trip than another, even though the hours of service may be practically the same, the most important point of daily entries is that it affords an opportunity to locate errors in fuel distribution or to check one engine against another in the same class of service, and which could not be discovered in any other way. It is of no advantage to compare one division with another, or one road with another. The only true comparison is, as before stated, to find out what it is possible to do in each class of service and establish that as a standard to work to. Another point in favor of the daily record is that division officers learn more concerning the items that affect the fuel cost per car mile and per 1,000 gross ton miles, such as terminal consumption, light engine movement, double-heading, delays on line and many other things. Due to so many different items affecting fuel consumption, it is difficult to explain fuel increases 30 to 60 days after the fuel is consumed without some data being kept during the time the fuel is being used. Post-mortem examinations are scientifically useful in a general way, but do not help the individual examined.

The clerk handling the performance sheet also attends to the correspondence of the assistant superintendent of locomotive fuel service, and it is his duty to furnish proper information regarding engines making poor performance.

A letter size blue-print containing concrete information is posted at each roundhouse not later than the fifteenth of each month, showing the performance on each division in each class of service for the previous month, a red line indicating the division showing the best performance in each class of service. A bulletin is issued by the superintendent each month addressed to all employees, showing the loss or gain in dollars and cents as against the previous month, and some brief comment is made on items that require special attention in order to make further improvement.

"Other matters that may require attention." Good feed water is an important item. It is not always practical to obtain this. On one division we found in making tests in passenger service that as high as 20 per cent. of the fuel used was due to the excessive amount of water blown out of the boiler. By applying smaller injectors, securing more continuous boiler feed, which is particularly desirable where water is treated in engine tanks, and by careful handling of the engine, we found we could eliminate the worst tanks and almost entirely avoid the use of blow-off cocks on passenger trains.

It is an excellent plan to cultivate the acquaintance of the flue borer and the man who looks after the grates and to go into a firebox occasionally, as well as to visit the coal chute. Things that are learned in this way cannot be found out in any other way and it convinces these men that you are interested in their work and that they are an important asset in obtaining the proper use from fuel.

Sufficient draft through the ash pan is very important. It takes a great deal of air to burn coal properly. It is estimated that 20 lbs. or 260 cu. ft. of air is required for the proper combustion of one pound of coal, or 3,900 cu. ft. for each shovelful.

One thing that is frequently lost sight of is the relative cost of lubricants and fuel. I have in mind one division where the approximate cost of fuel was $83 and the cost of lubrication 45 cents for a round trip of about 500 miles. I don't advocate wasting oil. There should be an oil schedule, but oil schedules are sometimes made similar to fuel tests; there is someone along watching it. The lubricator never runs away. The engine oiling is done just before leaving the terminal or intermediate station. In daily service, the engineer has a number of other things to look after besides the lubricator. He is not infallible and may forget to ease off the lubricator feeds or watch the guide cups at the first stop. He should, of course, watch this closely and those having supervision over the crews should keep this feature in mind. But an engine should not be run with dry valves or cylinders. The engineers should carry extra oil with them and keep the engine well lubricated at all times. If careless in the use of oil, handle that on its merits, but it is just as reasonable, in my opinion, to say we could have just so much coal to make the trip with as to start the engineers out without an emergency supply of oil, to use in case something should happen on the line. When the work was first taken up, we gave each engineer an extra one-half gallon of valve oil, keeping a record of the extra oil and a close check on the amount of oil used by each engineer for a month, to see whether it was advisable to increase the oil schedule to save fuel. At the end of thirty days, we found it was not necessary to increase the oil allowance, but it is understood that we do not want to save oil at the expense of fuel.

Attention to detail is highly essential to locomotive operation. Things that are seemingly unimportant may have a decided effect on the final results. It can be safely left to the general officers to furnish new appliances. It is for us who are held responsible for the result, to keep posted and determine the best possible methods of handling such appliances to secure the maximum efficiency.

Keeping engines of a certain class in one working district is essential to proper fuel performance. Neither enginemen nor shopmen can learn the proper care of an engine in one trip. The argument that an engine is an engine and a man that knows his business ought to do as well with one as with another, is wrong and is based on false premises. Circumstances require, sometimes, that engines be shifted around considerably, but this is invariably done at the expense of the fuel bill.

The whole problem resolves itself into a question of hearty co-

operation on the part of all concerned. Anything that will help to establish a proper fuel performance on the railroad will help every other item of train operation. The work cannot possibly be departmentized. Every department on our line tries to help out in every way it can. The shop people gladly accept suggestions that make engines more economical in fuel and as comfortable for the enginemen as possible. They are very generous in inviting criticism in this respect. The same is true of the fuel department. Any changes that can be brought about in the handling or purchase of fuel that are practical are worked out.

Securing as nearly as possible a maximum tonnage rating for each locomotive is highly important for a proper fuel performance also. Of course, for obvious reasons, all of these things cannot be done at once. All of the engines are not right all of the time, neither are they all wrong all of the time, and this is also true of the men, and statements of this character should not be taken too seriously. When things go wrong, a good getting together is the best way to remedy them. We derive a great deal of benefit from the educational meetings held at the different points, and also from the different staff meetings held by the division officials. With the best system or method that can possibly be maintained, human error will always furnish the need of a very close supervision. Any device placed on the locomotive tends to make it more complicated and requires that the men who are handling it be taught its proper use and this emphasizes the need for greater education. Great good can be done in reducing the fuel bill of railroads by exercising proper care in the selection of our firemen, who will later become engineers and who will have under their supervision in the course of their career probably 50 to 100 other firemen, all of whom will profit more or less by the engineer's training. The need for firemen should be anticipated. These men, once employed, should be properly educated to perform their duties skillfully, and if they do not show aptitude, should not be allowed to remain in a vocation that they are not adapted to. A constant effort should be made to familiarize not only the enginemen but the engine handling forces and mechanics as to the right way to handle and care for locomotives, and their work should be checked up often enough to know that it is done in the right way. It is highly essential that the work of fuel economy have the unqualified support of the general officers from the president down, and on the lines which I represent we have this support.

In conclusion, I wish to say that the one thing that has done more to reduce the fuel bill on the Frisco Lines than anything else is the interest and loyalty displayed by our engineers and firemen, and it is only to be regretted that we cannot carry out all of the suggestions made by them as rapidly as we would like to.

Belgium Railway Developments.—The Belgian railway administration has decided to construct a new car repair shop at Monceau near Charleroi, in the heart of the industrial district, together with maintenance and erecting shops at Meirelbeke, near Ghent, and at Kinkempois, near Liège. This step has been rendered necessary by the increase in the traffic, which is illustrated by the following figures: On January 1, 1900, the total number of freight cars amounted to 60,548. Four years later the figure was 67,859, and allowing for the rolling stock now under construction and on order, there will be a total of 94,097 freight cars in service at the beginning of 1914, or an increase of about 27,000 cars in 10 years. Preliminaries have been completed in connection with the scheme for constructing a new railway from Heppen on the line from Moll to Diest, to a point on the Meuse near the Belgian-Dutch frontier. The line will cross several coal concessions in the new mining district of Limburg, and will involve the erection of large bridges over other railways. There will be no level crossings. Negotiations are proceeding with the Dutch State Railways regarding the building of an extension of their line to Sittard across the German territory.

General News.

A station and warehouse of the Atchison, Topeka & Santa Fe, together with several box cars, were destroyed by a fire at Center, Tex., on October 29. The loss was estimated at from $50,000 to $75,000.

In the competition for the Pommery cup, in France, last week, a monoplane of 160 h. p. was flown from Villacoublay to Stralsund, Pomerania, 590 miles, in 5 hours, 14 minutes, or at the rate of 112¾ miles an hour.

The Western Maryland had its first general "safety-first" meeting at Hagerstown, Md., October 30. The meeting was addressed by W. P. Borland, assistant chief inspector of safety appliances for the Interstate Commerce Commission.

Leon R. Taylor, now governor of the state of New Jersey, having succeeded to that position from that of Speaker of the House of Assembly by reason of the resignation of Governor Fielder, is only 31 years old; and ten years ago he was a brakeman on the Pennsylvania Railroad.

The office of Secretary J. W. Taylor, of the Master Mechanics' and Master Car Builders' Association and the Western Railway Club, together with the library of the Western Railway Club, has been removed from the Old Colony building to more commodious quarters at 1112 Karpen building, 900 South Michigan avenue, Chicago.

The railways entering Cincinnati have recently formed a smoke inspection bureau, and G. H. Funk, superintendent of fuel economy of the Chesapeake & Ohio, has been appointed chief smoke inspector. The city has been districted and deputies will be appointed for the purpose of making observations of locomotives smoking beyond the point of density allowed by the city ordinance. The bureau reports to the General Managers' Association of Cincinnati.

Seven young men from the ranks of employees of the Southern Pacific have recently been awarded scholarships in the school of practical railroading which that company maintains. They are A. C. Posey, a lease clerk; John A. Starbuck, a freight clerk; Warren Tucker, a station baggageman; J. J. Sullivan, assistant chief clerk on the Tucson division; P. A. Warrack, a file clerk; W. M. Whitney, a draughtsman, and F. E. Yoakum, a yard clerk. Five of the seven are college graduates.

Representatives of the engineers', firemen's, switchmen's, trainmen's and conductors' brotherhoods appeared before the Chicago city council committee on railway terminals on Monday last and presented arguments against the passage of the "anti-smoke" ordinance, which the committee has recommended, but which was referred back to it in order to give the employees opportunity to be heard. The men opposed the ordinance on the ground that while it does not mention electrification it would actually require it, as there is no other means of absolutely eliminating smoke; and they opposed electrification as dangerous. One of the speakers declared it would "make a slaughter house of the Chicago railway yards."

Arbitrators have been selected to arbitrate the wage controversy between the conductors and trainmen of the Chicago, Burlington & Quincy and the company. The differences involve 35 demands submitted by the employees regarding working conditions and wages, the principal demand being for a standardization of rates. The six arbitrators named are Henry S. Boutell, Washington, D. C., and Garrett J. Diekema, of Holland, Mich., representing the government; Fairfax Harrison, president, Chicago, Indianapolis & Louisville, and P. H. Morrissey, assistant to vice-president of the Chicago, Burlington & Quincy, representing the railway, and E. P. Curtis, vice-president of the Order of Railway Conductors, and E. L. Harrigan, general chairman of the Brotherhood of Railway Trainmen, representing the employees.

The San Pedro, Los Angeles & Salt Lake has organized a safety and efficiency committee, with H. C. Nutt, general manager, as chairman, and Howard Elliott as secretary; and division committees have been formed for the Los Angeles and Salt Lake divisions. In a statement issued announcing the new committees

a table is included showing that for the past six years the company's record for persons killed is 3 passengers (none in train accidents), 15 travelers in highway, 58 employees, and 67 trespassers, while 3,245 employees have been injured. "This safety movement is a movement for the employees, of the employees, and by the employees," says the circular. It is the men on the firing line, not the officers, who are getting hurt, and the movement should receive the active support of those whom it is intended to benefit. If, in going about your daily tasks, improper and dangerous conditions are noticed, no time should be lost in reporting it to some member of the division committee; perhaps it may be possible to eliminate entirely such conditions, or at least improve them. At any rate, the first step is to see it, the second to report it, the third to consider it by the committee, and the fourth, to dispose of it, either by recommendation to the central committee, or otherwise."

Disastrous Collision at Melun, France.

A press despatch of November 4, reports a collision on the evening of that day on the Paris, Lyons & Mediterranean at Melun, 27 miles south of Paris, in which 39 passengers were killed and a large number injured.

Valuation Committees for Missouri Pacific System.

J. R. Stephens, chief engineer of the Missouri Pacific System, has been appointed general chairman of valuation committees of the Missouri Pacific; St. Louis, Iron Mountain & Southern; Denver & Rio Grande, and Western Pacific, with headquarters at St. Louis. Mr. Stephens, as general chairman, has appointed valuation committees for the different roads as follows:

Missouri Pacific and St. Louis, Iron Mountain & Southern, C. H. Smith, engineer and chairman; T. L. Philips, attorney; F. P. Johnson, accountant, and R. J. Turnbull, motive power, machinery and rolling stock, with headquarters at St. Louis.

Denver & Rio Grande, Arthur Ridgway, engineer and chairman; J. G. McMurry, attorney; E. R. Dickenson, accountant, and J. F. Enright, motive power, machinery and rolling stock, with headquarters at Denver, Colo.

Western Pacific, T. J. Wyche, engineer and chairman; A. P. Matthews, attorney; J. F. Evans, accountant, and J. F. Enright, motive power, machinery and rolling stock, with headquarters at San Francisco, Cal.

"Safety First" on the Pennsylvania.

The Dispatch, a monthly leaflet issued by the Railroad Young Men's Christian Association at the Jersey City terminal of the Pennsylvania Railroad, announces in its current issue that during the next five months a half dozen lectures will be given at the association's rooms on safety first, and allied subjects. The first lecture will be by J. B. Fisher, superintendent of the New York division, November 28; and it is entitled "Efficiency." Other addresses are arranged for as follows: December, "Book of Rules," by J. Oscar Young, chairman Safety Committee. January, "Air Brakes and Their Relation to Successful Train Operation," by B. R. Dixon, air brake inspector. January, "Signals," by W. M. Post, supervisor signals. February, "Courtesy," by Samuel Bannard. March, "Safety First," by H. J. Fackenthall, locomotive engineer.

This issue of the *Dispatch* contains a portrait of Mr. Young, the chairman referred to above, who was for some years a telegrapher on the Pennsylvania, and for ten years prior to his appointment as chairman of the Safety Committee was locomotive engineer.

The Railroad Y. M. C. A. at Jersey City has about 1,300 members.

The New Haven Road in Rhode Island.

The New Haven is very much concerned in your welfare because there are 195 miles of steam railroad and 346 miles of electric road in Rhode Island owned or controlled by the New Haven. Then there are each year 2,059 steamers sailing to and from Providence and 1,760 to and from Newport belonging to lines in which the New Haven has an interest, and at Newport are the main repair shops of the steamship lines, employing from 400 to 700 men. These steam, electric and water lines employ between 8,000 and 9,000 men, with an annual payroll of nearly $6,500,000. Rhode Island ought to take up intensive farming, and emulate Belgium.

The railroads' cost of living has increased. In 1910 41.58 per cent. of gross earnings went to the employees. In 1912 44.17 per cent. went to the employees. In 1910 3.77 per cent. went for taxes. In 1912 4.21 per cent. went for taxes. In 1910 7.91 per cent. went for dividends and surplus. In 1912 4.84 per cent. went for dividends and surplus. . . . A new management has come on the New Haven road. You have a director of the New Haven living here, Robert W. Taft. Feeling that Rhode Island should have not only a representative in the board, but also on the executive committee, Mr. Taft was elected a member of that committee on October 22. So that committee now has two from Massachusetts, one from Rhode Island, three from Connecticut, two from New York, one from Philadelphia, and myself, who while living in Boston, will try to represent the interests of all the states. Those who have business with the railroad do not meet the higher officers of the company frequently because of the multitude of transactions. It is, however, the desire of the company to have good men on guard at every place and to encourage them to be courteous, prompt and efficient in their dealings with the public. —*Chairman Howard Elliott; speech at Providence.*

"Safety First" on the Grand Trunk.

Howard G. Kelley, vice-president in charge of the operating department of the Grand Trunk Railway of Canada, has issued a circular establishing a safety organization, to attend to matters of this nature throughout the company's lines. There will be a general safety committee, consisting of the vice-president of the operating department (chairman), the vice-president in charge of the land and claims department, the chief engineer, the engineer of maintenance of way, the superintendent of motive power, the superintendent of the car department, the general superintendents and the chief claims agent. The safety engineer (George Bradshaw) will be secretary of this committee. On each division there will be a safety committee consisting of the superintendent (chairman), the master mechanic, the trainmasters, the assistant engineer, the supervisor of bridges and buildings, and seventeen men of lower rank—all departments being thus represented. Five other officers will be ex-officio members of the division safety committees, namely, superintendents of transportation, division engineers, superintendents of track, superintendents of bridges and buildings, and supervisors of signals. At the principal terminals—Montreal, Toronto, Detroit, Port Huron and Buffalo, the safety committee will be made up somewhat differently. At five principal shop centers, there will be safety committees of the locomotive department and of the car department, each separate from the other. Following are the principal rules for the guidance of the committees:

1. The chairman of each committee may appoint such members or sub-committees, in addition to those prescribed, as, in his opinion local conditions may require.

2. Unless otherwise provided, the chairman's chief clerk will act as secretary of division, terminal and shop committees.

3. All committees will meet during convenient business hours at least once a month at the office of the chairman unless otherwise designated. Special meetings may be called by the chairman of any committee.

4. Once every six months, division committees will make safety inspection, in a body, of their territory or the main part of it.

5. Division, terminal and shop committees will report to the general committee on prescribed forms and according to rules provided for the purpose and no change is to be made in the safety organization, as herein constituted, except by permission of the general safety committee.

6. Members of committees will be allowed necessary expenses when away from their homes upon committee business, and when service on committees causes a member to lose any time from his regular duties, he will be paid for such time at regular rates.

7. In the appointment of employee members of division committees, care will be taken to secure as far as possible, complete territorial representation. For example, other things being equal, it would be advisable to appoint the road foreman of engines from territory not represented by the engineer and the section

foreman from a section not included in the territory of the supervisor of track.

8. Members of committees from the lower grades are to be appointed by the chairman, and there will be rotation by new appointments, so as to bring about a gradual, but complete change of members so appointed every six months.

The circular concludes as follows: "No one will be censured, and no one should feel aggrieved on account of any report made to the safety committee, nor by reason of any action taken by it. The one object of the safety committee is to provide the greatest degree of safety for all."

M. C. B. and M. M. Conventions.

At the meeting of the executive committee of the Railway Supply Manufacturers' Association, held at the Vanderbilt hotel, New York, on November 4, it was decided to hold the convention of the Master Car Builders' Association and the American Railway Master Mechanics' Association at Atlantic City, N. J., next June. The convention of the Master Car Builders' Association will be held June 10-12, and the convention of the American Railway Master Mechanics' Association will be held June 15-17. Some attempts were made to have the conventions held at Milwaukee or Buffalo, but they were not successful.

It has been decided to hold two informal dances on Young's Million Dollar Pier, one for each convention, and also two at the Marlborough-Blenheim. This is practically the same as last year's program. Saturday will be set aside for viewing the exhibits; rolling chairs will be provided under the same conditions as obtained last year.

Central Railway Club.

At the next meeting of the Central Railway Club to be held November 14, at the Statler hotel, Buffalo, N. Y., an address will be presented by H. B. B. Yergason, of Rogers, Brown & Company, Cincinnati, Ohio. This address will cover iron ore mining, handling and shipping movements, the manufacture of pig iron and some of the more interesting steel processes, and will be illustrated by a series of moving pictures, showing all the operations.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May, 1914.

American Association of Demurrage Officers.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.

American Association of General Passenger and Ticket Agents.—W. C. Hope, New York.

American Association of Freight Agents.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.

American Association of Railroad Superintendents.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.

American Electric Railway Association.—H. C. Donecker, 29 W. 39th St., New York.

American Electric Railway Manufacturers' Assoc.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

American Railway Association.—W. F. Allen, 75 Church St., New York. Next meeting, November 19, 1913, Chicago.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles, Cal.

American Railway Engineering Association.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.

American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony building, Chicago.

American Railway Tool Foremen's Association.—A. R. Davis, Central of Georgia, Macon, Ga.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

American Society of Engineering Contractors.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.

American Wood Preservers' Association.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 20-22, 1914, New Orleans, La.

Association of American Railway Accounting Officers.—C. G. Phillips, 143 Dearborn St., Chicago. Annual meeting, May 28, Atlantic City, N. J.

Association of Railway Claim Agents.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St. Paul, Minn.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York. Next meeting, December 9-10, Galveston, Tex.

Association of Water Line Accounting Officers.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

Bridge and Building Supply Men's Association.—L. D. Mitchell, Detroit Graphite Co., Detroit, Mich. Meeting with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

Canadian Society of Civil Engineers.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

Civil Engineers' Society of St. Paul.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

Engineers' Society of Pennsylvania.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after second Saturday, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania.—E. K. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren P. Taylor, Richmond, Va. Next convention, May 20-22, Galveston, Tex.

General Superintendents' Association of Chicago.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

International Railway Congress.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

International Railway Fuel Association.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July, Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

Maintenance of Way & Master Painters' Association of the United States and Canada.—W. G. Wilson, Lehigh Valley, Easton, Pa. Next convention, November 18-20, Louisville, Ky.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.

Master Car Builders' Association.—J. W. Taylor, Old Colony building, Chicago.

Master Car & Locomotive Painters' Assoc. of U. S. and Canada.—A. P. Dane, B. & M., Reading, Mass.

National Railway Appliance Assoc.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.

Northern Railroad Club.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

Peoria Association of Railroad Officers.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

Railroad Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 2 Rector St., New York. Annual dinner, second week in December, 1913, New York.

Railway Club of Pittsburgh.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

Railway Electrical Supply Manufacturers' Assoc.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

Railway Fire Protection Association.—C. B. Edwards, Mobile & Ohio, Mobile, Ala.

Railway Gardening Association.—J. S. Butterfield, Lee's Summit, Mo.

Railway Development Association.—W. Nicholson, Kansas City Southern, Kansas City, Mo. Next meeting, November 11-12, Baltimore, Md.

Railway Signal Association.—C. C. Rosenberg, Bethlehem, Pa.

Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio.

Railway Supply Manufacturers' Assoc.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

Railway Tel. & Tel. Appliance Assoc.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

Richmond Railroad Club.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

Signal Appliance Association.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

Society of Railway Financial Officers.—C. Nyquist, La Salle St. Station, Chicago.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

Toledo Transportation Club.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

Traffic Club of St. Louis.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

Transportation Club of Buffalo.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

Transportation Club of Detroit.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, Chicago.

Utah Society of Engineers.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3rd Friday of each month, except July and August.

Western Canada Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

Western Society of Engineers.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The Illinois Central has recently discontinued the practice of employing train collectors on its southern lines, and fares are now being collected by the conductors.

The schedule of the Golden State Limited train of the Chicago, Rock Island & Pacific running between Chicago and Los Angeles, will next week be reduced from 71 to 68½ hours.

H. H. Gross, president of the National Soil Fertility League, addressed the Traffic Club of Chicago at a luncheon on October 30, on "The Decline of Our Food Supply and the Remedy."

The cotton crop of Texas is about 40 or 50 per cent. less than was estimated early in the season; and the principal railroads are taking measures to reduce expenses, in the shops and elsewhere.

Tramp steamers are now taking cotton direct from Galveston to Japan by way of Suez Canal. It is said that the most common rate is $1.30 per 100 lbs. which is 5 cents less than the usual rate by way of San Francisco.

Indictments reported last week have been followed by a decision of the court, in New York City, fining Isador Marshutz $250 for false classification of thermometers, which were sent to the railroad described as hardware.

The Illinois Central and Yazoo & Mississippi Valley will operate a special live stock and agricultural instruction train through the state of Mississippi from November 10 to 22, in co-operation with the Mississippi Agricultural & Mechanical College.

Harry A. Kelly, a merchant of Phoenixville, Pa., has been served with an injunction by the Court of Common Pleas of Chester county, enjoining him from selling packages, or "strip" tickets over the Pennsylvania Railroad. For some time past Kelly has been purchasing package tickets from the railroad, and retailing them at prices lower than the regular one-way or round-trip rates. The laws of the state make it a misdemeanor for anyone to sell railroad tickets except duly authorized agents of the carrier.

At Pittsburgh and East Liberty, on the Pennsylvania Railroad, passengers need not surrender their mileage books to the Pullman conductors when beginning a night trip. One intending to ride overnight and who owns a book of mileage coupons can take the book to the ticket office and exchange the required number of miles for a regular ticket. In this way he will get the benefit of the low mileage rate and will have his mileage coupons cancelled in his presence. If this new rule is found to be satisfactory to patrons it may be extended to other stations out of which there is heavy night travel.

Car Location.

The accompanying table, which was taken from bulletin No. 11 of the American Railway Association, gives a summary of freight car location by groups on October 1, 1913.

CAR LOCATION ON OCTOBER 1, 1913.

	New England.	N.Y., N.J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. & So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kans., Colo., Okla., Mo., Ark.	Texas, La., New Mexico.	Oregon, Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Total Cars Owned	88,207	684,512	280,156	204,173	172,254	492,886	18,925	114,969	29,138	134,091	141,443	2,360,754
Home Cars on Home Roads	42,180	375,917	101,889	106,132	83,448	333,350	7,018	59,982	12,924	74,260	95,058	1,292,158
Home Cars on Foreign Roads	46,027	308,595	178,267	98,041	88,806	159,536	11,907	54,987	16,214	59,831	46,385	1,068,596
Foreign Cars on Home Roads	54,256	311,026	222,082	80,054	75,452	203,052	9,883	54,805	28,845	57,614	40,131	1,137,200
Total Cars on Line	96,436	686,943	323,971	186,186	158,900	536,402	16,901	114,787	41,769	131,874	135,189	2,429,358
Excess or Deficiency	8,229	2,431	43,815	*17,987	*13,354	43,516	*2,024	*182	12,631	*2,217	*6,254	68,604
Surplus	127	1,892	946	5,273	466	6,078	1,053	7,217	5,182	12,185	1,575	41,994
Shortage	1,531	3,349	3,784	9,354	2,121	3,619	195	622	136	1,666	5,243	31,620
Shop Cars—												
Home Cars in Home Shops	6,272	37,555	22,447	13,287	12,970	29,119	509	8,675	2,320	4,494	6,920	144,568
Foreign Cars in Home Shops	1,160	7,643	8,447	1,854	2,270	5,569	412	1,907	790	2,033	461	32,546
Total Cars in Shops	7,432	45,198	30,894	15,141	15,240	34,688	921	10,582	3,110	6,527	7,381	177,114
Per Cent. to Total Cars Owned—												
Home Cars on Home Roads	47.82	54.92	36.37	51.98	48.44	67.63	37.08	52.17	44.35	55.38	67.21	54.73
Total Cars on Line	106.71	100.36	115.55	91.19	92.25	108.83	89.31	97.61	143.35	98.35	95.58	102.91
Home Cars in Home Shops	7.11	5.49	8.01	6.51	7.53	5.94	2.69	7.54	7.96	3.35	4.89	6.12
Foreign Cars in Home Shops	.95	1.11	3.02	.91	1.32	1.14	2.18	1.50	2.71	1.52	.33	1.38
Total Cars in Shops	8.06	6.60	11.03	7.42	8.85	7.08	4.87	9.04	10.67	4.87	5.22	7.50

*Denotes deficiency.

Summary of Revenues and Expenses of Steam Roads in July and August.

The Bureau of Railway Economics' summary of revenues and expenses and comments thereon for the months of July and August are as follows:

SUMMARY FOR THE MONTH OF JULY.

The railways whose returns are included in the summary for July operate 224,451 miles of line, or about 90 per cent. of the steam railway mileage in the United States. Total operating revenues for the month of July, 1913, amounted to $260,724,533. Compared with July, 1912, the total operating revenues show an increase of $13,413,516. These total operating revenues per mile of line averaged $1,162 in July, 1913, and $1,113 in July, 1912, an increase of $49 or 4.4 per cent. Freight revenue per mile increased 3.9 per cent. and passenger revenue per mile 5.9 per cent.

Operating expenses amounted to $182,677,490. This was $15,957,292 more than for July, 1912. These operating expenses per mile of line averaged $814 in July, 1913, and $750 in July, 1912, an increase of $64 per mile, or 8.5 per cent.

Net operating revenue amounted to $78,047,043. This was $2,543,776 less than for July, 1912. Net operating revenue per mile of line averaged $348 in July, 1913, and $363 in July, 1912, a decrease of $15 per mile, or 4.1 per cent.

Taxes for the month of July amounted to $10,753,106, or $47.91 per mile, an increase of 7.3 per cent. over July, 1912.

Operating income averaged $300 per mile of line, and in July, 1912, $319, thus decreasing $19, or 5.9 per cent. Operating income for each mile of line for each day in July averaged $9.68 and for July, 1912, $10.28.

The operating ratio for July was 70.1 per cent., which is comparable with 70.4 per cent. in June, 1913, and 67.4 per cent. in July, 1912.

The railways of the eastern district show an increase in total operating revenues per mile of line as compared with July, 1912, of 5.5 per cent., the railways of the southern district an increase of 4.2 per cent., and the railways of the western district an increase of 3.7 per cent. Operating expenses per mile increased 12.0 per cent. on the eastern railways, 5.1 per cent. on the southern railways, and 6.4 per cent. on the western railways. For the eastern railways net operating revenue per mile decreased 7.8 per cent., for the southern railways it increased 1.6 per cent., while for the western railways it decreased 1.3 per cent. The increase in taxes per mile was 4.2 per cent. in the eastern district, 6.9 per cent. in the southern district, and 10.7 per cent. in the western district. Operating income per mile decreased 10.0 per cent. in the East, increased 0.8 per cent. in the South, and decreased 2.8 per cent. in the West.

When the returns for the seven months of the calendar year 1913 are compared with those of the corresponding months of 1912, they show an increase in total operating revenues per mile of 8.1 per cent., an increase in operating expenses per mile of 9.7 per cent., and an increase in net operating revenue per mile of 4.0 per cent. This net operating revenue per mile increased 0.5 per cent. in the eastern

district as compared with the corresponding period of the previous year, increased 5.6 per cent. in the southern district, and increased 7.4 per cent. in the western district.

The following table shows the per cent. of operating revenues consumed by each class of expenses:

PER CENT. OF TOTAL OPERATING EXPENSES.

	July.		Calendar year ending December 31.		Seven months ending July 31.	
	1913.	1912.	1912.	1911.	1913.	1912.
Maintenance of way and structures	15.0	13.9	12.8	12.7	14.0	12.9
Maintenance of equipment	16.6	15.9	16.0	15.7	17.3	16.6
Traffic expenses	2.1	2.1	2.0	2.1	2.1	2.2
Transportation expenses	34.0	33.1	35.5	35.4	36.8	37.5
General expenses	2.4	2.4	2.4	2.5	2.6	2.6
Total operating expenses	70.1	67.4	68.7	68.4	72.8	71.8

SUMMARY FOR THE MONTH OF AUGUST.

The railways whose returns are included in the summary of revenue and expenses for August operate 224,491 miles of line, or about 90 per cent. of the steam railway mileage in the United States. The operating revenues for the month of August, 1913, amounted to $273,602,765. Compared with August, 1912, the total operating revenues show an increase of $3,965,777. These total operating revenues per mile of line averaged $1,219 in August, 1913, and $1,212 in August, 1912, an increase of $7 or 0.6 per cent. Freight revenue decreased $59,372, which is equivalent to a decrease of 0.9 per cent. on a per-mile basis. Passenger revenue per mile increased 4.3 per cent.

Operating expenses amounted to $186,533,549. This was $13,798,063 more than for August, 1912. These operating expenses per mile of line averaged $831 in August, 1913, and $776 in August, 1912, an increase of $55 per mile, or 7.1 per cent.

Net operating revenue amounted to $87,069,216. This was $9,832,286 less than for August, 1912. Net operating revenue per mile of line averaged $388 in August, 1913, and $435 in August, 1912, a decrease of $47.52 per mile, or 10.9 per cent.

Taxes for the month of August amounted to $11,002,857, or $49.01 per mile, an increase of 9.8 per cent. over August, 1912.

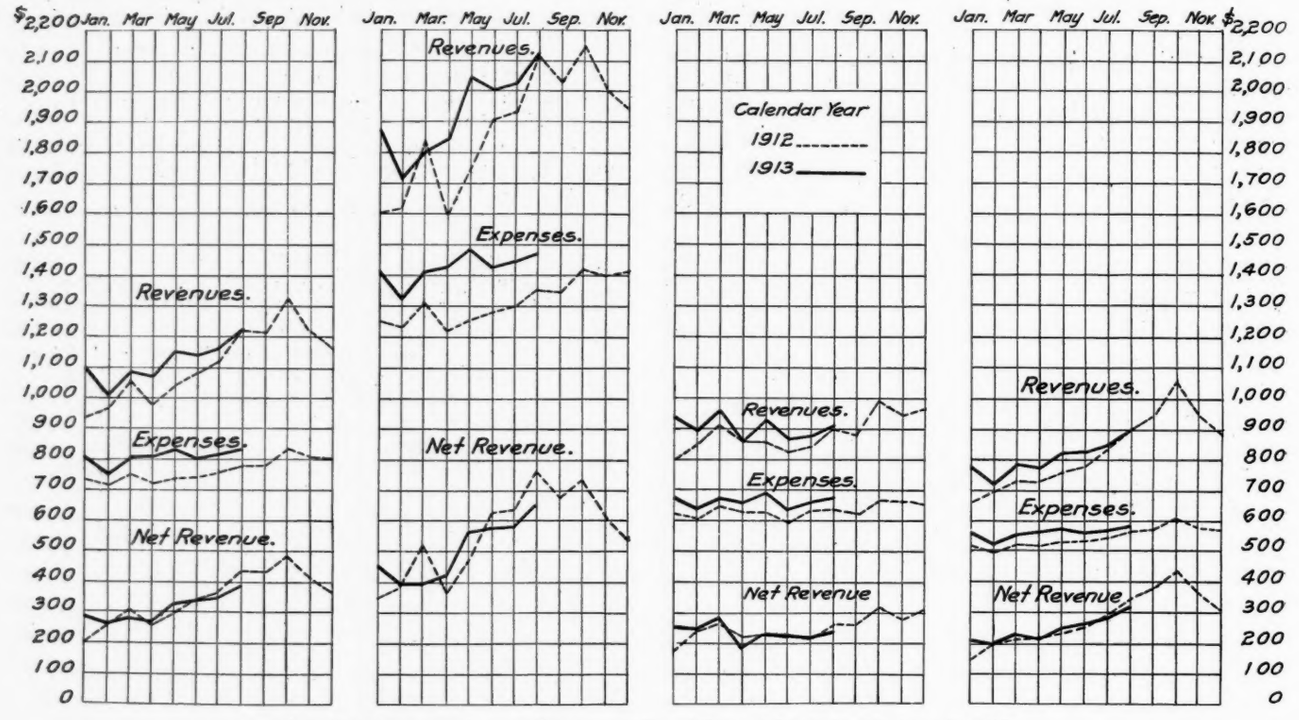
Operating income averaged $340 per mile of line, and in August, 1912, $394, thus decreasing $54, or 13.6 per cent. Operating income for each mile of line for each day in August averaged $10.97 and for August, 1912, $12.70. The operating ratio for August was 68.2 per cent., which is comparable with 70.1 per cent. in July, 1913, and 64.0 per cent. in August, 1912.

The railways of the eastern district show an increase in total operating revenues per mile of line as compared with August, 1912, of 0.8 per cent., the railways of the southern district an increase of 1.4 per cent., and the railways of the western district an increase of 0.4 per cent. Operating expenses per mile increased 9.4 per cent. on the eastern railways, 6.1 per cent. on the southern railways, and 5.2 per cent. on the western railways. For the eastern railways net operating revenue per mile decreased 14.3 per cent., for the southern railways it decreased 9.9 per cent., and for the western railways it decreased 7.4 per cent. The increase in taxes per mile was 5.6 per cent. in the eastern district, 7.2 per cent. in the southern district, and 15.1 per cent. in the western district. Operating income per mile decreased 17.3 per cent. in the East, decreased 12.2 per cent. in the South, and decreased 9.8 per cent. in the West.

Comparison of the returns for the two months of the current fiscal year with those of the corresponding months of the previous fiscal year reveals an increase in total operating revenues per mile of 2.4 per cent., an increase in operating expenses per mile of 7.8 per cent., and a decrease in net operating revenue per mile of 7.8 per cent. This net operating revenue per mile of the eastern railways decreased 11.3 per cent. as compared with the corresponding period of the previous year, that of the southern railways decreased 4.7 per cent., and that of the western railways decreased 4.6 per cent.

When the returns for the eight months of the calendar year 1913 are compared with those of the corresponding months of 1912, they show an increase in total operating revenues per mile of 7.0 per cent., an increase in operating expenses per mile of 9.3 per cent., and an increase in net operating revenue per mile of 1.3 per cent. This net operating revenue per mile decreased 2.3 per cent. in the eastern district as compared with the corresponding period of the previous year, increased 3.4 per cent. in the southern district, and increased 4.7 per cent. in the western district.

The diagrams show the variations in operating revenues, operating expenses, and net operating revenue per mile for the separate months of the calendar year 1912 and of the



Monthly Revenues and Expenses Per Mile of Line in 1912 and 1913.

calendar year 1913 to date. The following table shows the per cent. of operating revenue consumed by each class of expenses:

PER CENT. OF TOTAL OPERATING EXPENSES.

	August.		Calendar year ending December 31.		Eight months ending August 31.	
	1913.	1912.	1912.	1911.	1913.	1912.
Maintenance of way and structures	14.4	13.4	12.8	12.7	14.0	12.9
Maintenance of equipment	16.5	15.3	16.0	15.7	17.2	16.4
Traffic expenses	2.0	1.8	2.0	2.1	2.1	2.2
Transportation expenses	33.0	31.4	35.5	35.4	36.3	36.6
General expenses	2.3	2.1	2.4	2.5	2.6	2.5
Total operating expenses	68.2	64.0	68.7	68.4	72.2	70.6

Revenues and Expenses of Large Steam Roads for September.

The following figures were compiled by the Interstate Commerce Commission from monthly reports of operating revenues and expenses of large steam roads for the month of September, on hand November 3, 1913. No reports are included for roads whose operating revenues for the year ended June 30, 1913, did not reach $1,000,000. The figures are compiled as rendered and

REVENUES AND EXPENSES OF LARGE STEAM ROADS FOR SEPTEMBER.

Item.	United States.		Eastern District.		Southern District.		Western District.	
	1913.	1912.	1913.	1912.	1913.	1912.	1913.	1912.
Number of reports included	125		54		29		42	
FOR THE MONTH OF SEPTEMBER.								
Average number of miles operated	155,411.63	154,303.27	39,214.63	39,087.86	32,228.09	32,079.52	83,968.91	83,135.89
Total operating revenues	$192,044,352	$185,250,846	$82,885,906	$79,466,869	$30,978,992	$28,667,505	$78,179,454	$77,116,472
Total operating expenses	130,241,250	119,854,156	58,768,977	52,064,006	22,059,655	20,494,628	49,412,617	47,295,522
Net operating revenue	61,803,102	65,396,690	24,116,929	27,402,863	8,919,336	8,172,877	28,766,837	29,820,950
Revenues per mile	1,235	1,200	2,113	2,033	961	893	931	927
Expenses per mile	838	776	1,498	1,332	684	639	588	568
Net revenue per mile	397	424	615	701	277	254	343	309
FOR THE THREE MONTHS ENDING WITH SEPTEMBER.								
Average number of miles operated	155,363.93	154,212.10	39,194.29	39,085.60	32,228.23	32,065.17	83,941.41	83,061.33
Total operating revenues	$563,133,167	$544,693,689	$248,288,260	$239,817,358	$89,493,059	$85,180,886	$225,351,848	$219,695,445
Total operating expenses	387,903,357	355,915,713	175,159,432	155,395,656	65,768,588	61,825,746	146,975,337	138,694,311
Net operating revenue	175,229,810	188,776,976	73,128,828	84,421,702	23,724,471	23,354,140	78,376,511	81,001,134
Revenues per mile	3,624	3,532	6,334	6,135	2,777	2,656	2,684	2,644
Expenses per mile	2,496	2,308	4,459	3,975	2,041	1,928	1,751	1,669
Net revenue per mile	1,128	1,224	1,865	2,160	736	728	933	975
COMPARATIVE FIGURES BASED ON ALL ROADS HAVING REVENUES ABOVE $1,000,000 PER ANNUM REPORTING FOR SEPTEMBER, 1912.								
For the month:	1912.	1911.	1912.	1911.	1912.	1911.	1912.	1911.
Average number of miles operated	220,452.81	218,288.11	57,932.85	57,484.07	41,438.64	41,120.17	121,081.32	119,683.87
Revenues per mile	$1,212	$1,136	$2,025	$1,903	$875	$866	$938	$861
Expenses per mile	779	725	1,343	1,244	620	582	564	525
Net revenue per mile	433	411	682	659	255	284	374	336
For three months:								
Average number of miles operated	220,311.72	218,202.20	57,930.39	57,477.78	41,424.91	41,078.85	120,956.42	119,645.57
Revenues per mile	$3,549	$3,281	$6,074	$5,584	$2,607	$2,499	$2,662	$2,443
Expenses per mile	2,314	2,150	3,991	3,661	1,877	1,727	1,660	1,569
Net revenue per mile	1,235	1,131	2,083	1,923	730	772	1,002	674

should not be considered final, inasmuch as scrutiny of the reports may lead to their modification before acceptance.

Development of the Southern States.*

Great as has been the progress of the Southeastern States in the past, I believe that it is but the promise of what their enterprising and progressive people shall accomplish. In the nine States of Virginia, the Carolinas, Georgia, Florida, Alabama, Mississippi, Kentucky and Tennessee, the Census Bureau reports that the value of farm property increased from $2,189,114,320 in 1900, to $4,461,411,250 in 1910, an increase of 103.8 per cent., as compared with 35.6 per cent. for New England, 28.1 per cent. for the Middle Atlantic States, and 78 per cent. for the Middle Western States of Ohio, Indiana, Illinois, Michigan and Wisconsin. The value of all farm crops increased 102 per cent., the value of manufactures from $701,560,000 in 1899, to $1,455,927,000 in 1909, an increase of $754,871,000, or 107.7 per cent.

Since these census figures were compiled the growth of this section, so greatly favored by nature, has continued. Southeastern farmers are essentially progressive. They are adopting the most improved methods, and the figures of the United States Agricultural Department show that, making allowance for seasonal variations, the average yield per acre of each crop reported on by the department is increasing in every Southeastern State.

*From an address by W. W. Finley, President of the Southern Railway, at the National Conservation Exposition, Knoxville, Tenn., October 21.

The relation between this increased production and railway facilities is graphically shown by statistics of the Interstate Commerce Commission, which show that the freight traffic of the railways in the territory south of the Ohio and Potomac rivers and east of the Mississippi increased from 17,096,672,680 ton miles in 1900 to 33,840,444,295 ton miles in 1910, or 97.9 per cent., while in the same period passenger traffic increased from 1,501,533,479 passenger miles to 3,223,945,565 passenger miles, or 114.7 per cent. In this period the facilities of the railways of the Southeast were not increased in proportion to the increase in traffic. The ability of the railways to carry the constantly increasing products of the section to market has been in great measure due to a larger and more efficient use of their facilities. The most urgent need will be in the enlargement of the facilities of existing railway lines by the provision of additional trackage and equipment. In 1900 the railway system of the Southeast, considered as a whole, was substantially a single track system. The point has already been reached where the commerce of the section can no longer be handled on single-track railways. In the ten years from 1900 to 1910 the length of second track on the railways of the Southeast increased from 264 miles to 1,740 miles, or 558.58 per cent. Great as this percentage of increase is, it represents the double-tracking of relatively a small proportion of the railway mileage of the Southeast.

INTERSTATE COMMERCE COMMISSION.

The New Orleans Board of Trade has filed a complaint with the Interstate Commerce Commission asking a readjustment of the rates on grain and grain products, hay and feed from New Orleans to Mississippi points.

The commission has suspended from November 28 until May 28 certain tariffs presented by the Chicago, Rock Island & Pacific and the St. Louis & San Francisco advancing rates on wheat and other grains from Oklahoma to Memphis.

The commission has suspended from November 29 until May 29 the operation of certain tariffs of the Northern Pacific, by which it was proposed to advance rates on cement from Trident and Gardiner, Mont., to Spokane, Seattle and other points.

The commission has further suspended from November 18 until May 18 the operation of a Baltimore & Ohio Chicago terminal tariff advancing rates on crushed stone from McCook and Thornton, Ill., to various points in Indiana and Michigan.

The commission has suspended from November 27 until May 27 certain tariffs presented by the Chicago, Burlington &

Quincy and the Grand Trunk increasing switching charges on coal and coke over the Chicago & North Western to Ravenswood.

The commission has suspended from November 5 until May 5 the operation of certain items in Chicago & North Western tariff No. 7,423, increasing rates on grain from points in Central Freight Association Territory to Eastern and Seaboard points.

The commission has further suspended from November 17 until May 17 the operation of certain tariffs by which it was proposed to increase rates on lumber from stations on the St. Louis, Iron Mountain & Southern to stations on the Atchison, Topeka & Santa Fe.

The Topeka Traffic Association has filed with the Interstate Commerce Commission a complaint against class and commodity rates from New Orleans and Memphis to Topeka, which are declared high as compared with the rates from those points to other points in Kansas, Missouri and Nebraska.

The commission has further suspended from November 29 until May 29 the item in a supplement to Agent W. H. Hosmer's tariff, which contains advanced rates on packing house products, C. L., from Marshalltown, Cedar Rapids and Des Moines, Ia., to Chippewa Falls, Wis., Eau Claire, Wis., St. Paul, Minn., and other points.

Representatives of 34 coal companies operating in the Springfield district of Illinois appeared at a hearing before Interstate Commerce Commissioner Harlan at Chicago, on October 27, on their complaint against the adjustment of rates from the Springfield group as compared with the rates of other groups from Illinois to Indiana.

The commission has further suspended from November 12 until May 12 the operation of certain schedules in tariffs of the Illinois Central, Louisiana Railway & Navigation Company, Louisville & Nashville, Sunset Lines, the Queen & Crescent, New Orleans Great Northern, New Orleans, Texas & Mexico, Louisiana Southern and the Texas & Pacific.

The commission has ordered suspended until February 21 the operation of an item in Illinois Central tariff No. 4,285. It was proposed by the suspended item to increase the rates on cotton seed to Memphis, from points in Mississippi. The present rate from these points to Memphis is 12 cents per 100 lbs.; the proposed rate is 15 cents per 100 lbs.

The commission has suspended from November 1 until May 1 the operation of certain items in a supplement to Chicago, Rock Island & Pacific tariff C-6,948, which provide for the cancellation of through rates now in effect on grain in carloads, from points in Chicago, St. Louis and Mississippi River rate territory to stations in Oklahoma on the Fort Smith & Western.

The commission has further suspended from November 29 until May 29 certain schedules in the tariff of the Chicago, St. Paul, Minneapolis & Omaha, by which it was proposed to cancel commodity rates on emigrant movables between Chicago, St. Paul, St. Louis, Kansas City and other points and stations on the South Dakota Central, leaving in effect class rates, which would have resulted in material advances.

The commission has further suspended from November 14 until May 14 the operation of certain tariffs of the Chicago & Eastern Illinois, the Rock Island and the Sunset Central lines, the Missouri Pacific and the St. Louis & San Francisco. The tariff contains advances in rates on lumber of all kinds from points in Arkansas, Louisiana, Missouri, Oklahoma and Texas to points in Iowa, Wisconsin and other states.

The commission has suspended from November 1 until March 1 certain schedules in a supplement to the tariff of the Southern Railway. The present switching charge assessed by the Southern Railway on carload shipments of coal and coke moved from point of interchange with the Washington Southern at Potomac Yards, Va., to industries located on the Southern Railway within the switching limits of Alexandria, Va., is 11 cents per ton. It was proposed by the suspended schedules to increase this charge to 35 cents per ton.

Examiner Flynn, of the Interstate Commerce Commission, on October 21, held a hearing at Denver, Colo., on complaint of Summit county citizens against the Colorado & Southern, attacking an advance in rates on zinc ore between Breckenridge and Denver. This rate is over a line which the railway recently sought to abandon because of the great expense of operation during the winter over Boreas Pass, and which the state railroad commission ordered re-opened in a decision which was sustained by the Supreme Court of the state.

The commission has suspended until February 28 the schedules in certain tariffs proposed to cancel through rates on lumber and articles taking lumber rates from points on the Oregon-Washington Railway & Navigation Company via Plummer, Idaho, and the Chicago, Milwaukee & St. Paul, destined to points located on or reached via the latter road. This would result in material increases on such traffic when routed via Plummer, Idaho, on and after October 31, 1913. The commission now has under investigation the proposed cancellation of rates on lumber and other commodities from North Pacific Coast points via various other western gateways.

The commission has suspended from November 8 until March 7 the item in Agent M. P. Washburn's tariff, which proposed to establish a carload rate of 15 cents per 100 lbs. for the transportation in tank cars of low grade blackstrap molasses from Mobile, Ala., to St. Louis, Mo., and East St. Louis, Ill., when imported from Cuba, unloaded into storage tanks at Mobile and reshipped from storage tanks via the Mobile & Ohio. The present rate on this commodity from Mobile to the same points of destination is 21 cents per 100 lbs. It is alleged in complaints filed with the commission that the proposed rate is discriminatory, in that it would favor a particular shipper.

The commission has suspended from November 1 until March 1 certain schedules in a supplement to Agent F. A. Leland's tariff, which proposed to cancel present through commodity rates on inedible tallow, C. L., from Muskogee, Oklahoma City and other points in the state of Oklahoma to Cincinnati, Ohio, and Hammond, Ind., and certain other interstate points, provision being made for the application of class rates on and after November 1, 1913. The present commodity rate on this traffic from Muskogee, Okla., to Hammond, Ind., for example, is 30 cents per 100 lbs.; the class rate applicable as a result of the proposed cancellation would have been 53 cents per 100 lbs.

The commission has suspended from November 1 until January 28, supplements to the tariffs of the Minneapolis, St. Paul & Sault Ste. Marie, the Northern Pacific and the Great Northern. Under present tariff provisions, shipments of butter, eggs, cheese and dressed poultry may be forwarded from local stations on the lines of the above named carriers to St. Paul, Minn., and certain other points for concentration and storage at the local rates into the concentration point. The local rates up to 40 cents per 100 lbs. are refunded to shippers on such traffic when reshipped from concentration points to final destinations in Oregon, Washington and other western states. It is proposed by the suspended schedules to cancel such privileges.

Kansas-Iowa Brick Rates.

Opinion by Chairman Clark:

Proposed increased rate on brick from points in the Kansas gas belt to Chicago, Rock Island & Pacific Railway stations in Iowa found not to have been justified. (28 I. C. C., 285.)

Brick Rates from Ohio Points to Huntington, W. Va.

Opinion by Chairman Clark:

Increased rates on brick in carload lots from the Hocking, Shawnee and Zanesville groups in southern Ohio to Huntington, W. Va., held not justified. (28 I. C. C., 292.)

Complaint Dismissed.

Lebanon Commercial Club v. Louisville & Nashville et al. Opinion by Commissioner Marble:

Local rates for the transportation of bituminous coal in carloads from mines located on the Louisville & Nashville in Virginia and Tennessee to Louisville, Ky., are less than to Lebanon, Ky., an intermediate local point 67 miles nearer to the mines than is Louisville, and vary according to the grade of the coal, while the rates to Lebanon are not so varied. The commission

decided that as the rates to Louisville are influenced largely by the movement of bituminous coal by the Ohio river and by competing rail carriers, the lower and varied rates to that point have not been shown to be unjustly discriminatory as against Lebanon. (28 I. C. C., 301.)

Brick Rates to Huntington.

Opinion by Chairman Clark:

Increased rates on brick in carload lots from the Hocking, Shawnee and Zanesville groups in southern Ohio to Huntington, W. Va., not justified. New tariff ordered withdrawn. (28 I. C. C., 292.)

Paper Rates from Manitowoc and Milwaukee to Kaukauna, Wis.

Opinion by Commissioner Meyer:

The propriety of an increase of a rate of 5½ cents on one kind of paper to 7½ cents, coincident with a reduction of a rate of 10 cents to 7½ cents on all other kinds of paper, from Milwaukee and Manitowoc, Wis., to Kaukauna, Wis., was found to have been established. (28 I. C. C., 305.)

Vegetable Rates Reduced.

Crutchfield, Woolfolk & Clore et al v. Florida East Coast Ry. et al. Opinion by Commissioner McChord:

Rates charged by defendants for transportation of vegetables in mixed carloads and potatoes in hampers from points on the line of the Florida East Coast Railway, in Florida, to Chicago, Ill., found unreasonable. Reparation ordered. (28 I. C. C., 274.)

Commodity Rates Between Missouri River Points; Increases Approved.

Opinion by Commissioner McChord:

Proposed increased rates on commodities between Missouri river points not found to result in excessive revenue to respondents. . . . Order of suspension vacated.—*Reported last week.* (28 I. C. C., 265.)

Broom Rate Increased.

Opinion by Commissioner Marble:

By an order dated February 6, 1913, the commission suspended tariffs, which increased certain carload rates on brooms to Colorado common points ten cents per 100 lbs. The commission decided that the carriers had justified the increased rates and vacated the order of suspension. (28 I. C. C., 310.)

Oklahoma-Colorado Potato Rates.

Opinion by Commissioner McChord:

Proposed increased rates on potatoes from points in Oklahoma to points in Colorado held to have been justified. Order of suspension vacated.

If, when viewed in the light of those considerations which enter into proper rate making, a particular rate is fair and just for the service performed, the price at which the shipper markets his product cannot be accepted as the controlling factor in fixing the rate. (28 I. C. C., 298.)

Refrigerating Charges Not Increased.

In re investigation and suspension of advances in charges by carriers for the refrigeration of carload shipments of fruit, vegetables, etc., between points in Colorado and Utah. Opinion by Commissioner Marble:

The proposed increase to $40 per car for icing deciduous fruits and vegetables was withdrawn and the previous rate of $35 per car was restored. The commission decided that the rate of $35 per car was reasonable and dismissed the proceedings. (28 I. C. C., 326.)

New Mexico Coal Rates.

Opinion by Commissioner Marble:

The commission found that the proposed increases in the New Mexico coal rates were unreasonable and that the present rates were reasonable. The only reason for the proposed increases was that the carriers could not agree on the division of the present joint rates. If the carriers interested at the end of 60 days, are still unable to agree upon division, the commission will, upon petition, prescribe the proper division. (28 I. C. C., 328.)

Reparation Awarded.

Acme Portland Cement Company v. American Express Company. Opinion by Commissioner Marble:

The complainant shipped a large number of securities from New York to Spokane, Wash., to be canceled. No valuation was put upon the shipment by the shipper. The complainant appraised the shipment at its par value and collected charges accordingly. The commission found that this was unreasonable and that the value of the property represented by the securities should be taken as the value of the securities. (28 I. C. C., 316.)

Butter and Cheese Rates Not Increased.

Opinion by Commissioner Marble:

By the tariff under suspension, the Delaware, Lackawanna & Western proposed to increase the rate on butter and cheese to New York from points on its Cincinnatus branch from 28 cents and 30 cents per 100 lbs. to 29 cents and 35 cents per 100 lbs. respectively. The line of the Lackawanna from its Cincinnatus branch to New York passes through Pennsylvania and New Jersey. The reason for the proposed increases was that the earnings of the Cincinnatus branch were not adequate and large sums had been expended on additions and betterments. The commission found that the Lackawanna had paid substantial dividends on its stock and decided that the proposed increased rates were unjust and unreasonable and ordered the present rates to be continued for the next two years. (28 I. C. C., 330.)

Lumber Rates Not Increased.

Opinion by Commissioner Marble:

By the tariff under suspension it was proposed to increase the rates on lumber from New Castle, New England Mills, Colfax and Gold Run, Cal., to points intermediate between the California-Nevada state line and Reno, Nev., over the Southern Pacific. By this tariff it was proposed that the commodity rate of $2 per ton to Verdi, and $2.25 per ton to Reno, should be canceled, leaving class rates only in effect. These rates amount to $5.40 per ton and are so high that no contention is made that they should be regarded as reasonable. The commission found that the proposed cancellation of rates was made only for the purpose of removing a factor which might indicate a violation of the fourth section of the act to regulate commerce. No attempt was made to justify the rates which would result, beyond the statement that nothing will be offered for transportation thereunder. The commission decided that the proposed increases were unreasonable and ordered that the present rates should be continued for the next two years. (28 I. C. C., 313.)

Mileage Books.

In re practices and regulations governing the issuance, sale and exchange of mileage books. Opinion by Commissioner Marble:

The railroad commission of South Carolina complains that the requirements applying to the interchangeable mileage books used in interstate travel, to the effect that the coupons must be exchanged at ticket windows, is unreasonable in itself and results in discrimination against interstate travelers in South Carolina as compared with intrastate travelers therein whose mileage is good upon trains without such exchange. The Interstate Commerce Commission is asked to condemn the practice of carriers east of the Mississippi and south of the Ohio and Potomac rivers by which mileage is good only for exchange at ticket offices and to require that such mileage shall be receivable upon trains for transportation. The commission found that the acceptance of state mileage upon trains and the contemporaneous requirement that interstate mileage must be exchanged for tickets did not constitute a discrimination against interstate travelers. No interstate traveler is injured or hindered in any way by the fact that state travelers in South

Carolina may use the state mileage upon trains. No interstate traveler would be saved from any burden or inconvenience by the withdrawal from travelers in South Carolina of the privilege of presenting mileage books on trains. And therefore, no discrimination results from these practices. Neither is the practice unreasonable. Ordinary passengers must now pay a higher rate than the mileage rate and must exchange their cash for tickets at the station before checking baggage and before boarding trains. If they tender cash upon trains they are charged a penalty in addition to the single ticket rate. Holders of mileage tickets have experienced some inconveniences, but these can be removed by increased efficiency in station operation which will benefit all travelers alike. The complaint was dismissed. (28 I. C. C., 318.)

STATE COMMISSIONS.

The Oklahoma Corporation Commission has denied a petition of the railways of the state for a rehearing on its recent order requiring trains to stop at stations nearest the state line in order to allow interstate passengers to purchase tickets at the state rates.

The Missouri Public Service Commission has directed the Mississippi River & Bonne Terre, Missouri & North Arkansas, and the Missouri Southern to file with the commission, by December 31, statements showing their physical valuation in support of their application for permission to charge three-cents-a-mile passenger fares. The companies will also be required to open their books to accountants in the employ of the commission.

The Minnesota Railroad and Warehouse Commission has announced its new tariffs of freight rates prepared to conform to the Cashman distance tariff law enacted by the last legislature and effective next January. The new rates differ little from the rates adopted in 1907, and sustained by the Supreme Court in the Minnesota rate case, except that they are both maximum and minimum rates, while the existing rates are only maximum rates.

COURT NEWS.

The Supreme Court of the United States on Monday of this week sustained the order of the Interstate Commerce Commission reducing freight rates on lemons from California to Atlantic seaboard points from $1.15 per 100 lbs. to $1.

Willard P. Brown, of the firm of W. P. Brown & Co., has pleaded guilty in the Criminal Branch of the Federal District Court, New York City, and has been fined $2,000, for payment of money to railroad inspectors so as to facilitate the handling of eggs consigned to his concern, in violation of the interstate commerce law. In the books of the firm these payments were first entered as "graft," but when the government started the investigation into the egg damage claim frauds they were changed to something else.

Passes in New Jersey.

The Supreme Court of New Jersey has reversed a finding of the Public Utility Commission involving free transportation of certain state employees over the Delaware, Lackawanna & Western. In 1911 the general railroad law of the state was amended so as to give members of the Water Commission free transportation.

The Lackawanna refused to honor the passes issued under this amendment and instituted the test case, which it has now won. In the opinion Justice Garrison said:

"Once eliminate the element of public policy as the legal justification, and nothing is left but the bare fact that the subjects of free transportation are public officials, and I know of no principle of law or rule of property that will justify the taking of the property of any one of these public service corporations and handing it over to public office holders merely because they are holders of public office."

This decision will affect holders of passes on all railroads with the exception of members of the legislature and about 25 state officials who are the heads of departments. Several hundred state employees will henceforth have to pay fare.

The Fallaciousness of Averages.

The decision of the Supreme Court of the United States, sustaining a reduction of freight rates made by the Railroad Commission of Indiana, which was briefly noticed in our issue of October 24, page 800, is based mainly on the ground that the railroad company, in claiming that the rates prescribed by the commission were confiscatory, produced no traffic statistics to prove the claim. The Circuit Court, in deciding in favor of the railroad, had accepted statistics based on averages which really proved nothing.

The opinion, which was by Justice Hughes, is in substance as follows, slightly abridged:

The Vandalia Railroad Company had secured an injunction restraining the enforcement of an order made by the Commission on December 14, 1906, prescribing maximum freight rates for certain intrastate traffic. Members of the Commission, and the shippers who were made defendants prosecuted the appeal.

The assignments of error are addressed to the single point that the evidence failed to warrant the conclusion that the prescribed rates were so unreasonably low that, if they were maintained, the company would be deprived of its property without due process of law.

The Vandalia Railroad Company is a consolidation, effected January 1, 1905, of five railroad companies. Of these the Terre Haute & Indianapolis extended from Indianapolis westward to the boundary between the states of Indiana and Illinois, and the St. Louis, Vandalia & Terre Haute extended from that point to East St. Louis, Ill. . . . The order applied to that portion of the road which lay between Indianapolis and the western boundary of Indiana, about 80 miles. The order was limited to the freight moving on "class rates." The existing rates were found by the Commission to be unreasonably high and the maximum rates in question were ordered to be substituted as just and reasonable.

There was no proof of the value of the road's property within the State of Indiana or of the return it received from its entire intrastate business. Nor was there proof of the value of that portion of its road which was affected by the order, or of the return from all of its intrastate business upon that part of its lines. No attempt was made to supply proof of that sort. For all that appears, the Vandalia Company might enjoy, notwithstanding the enforcement of the rates in question, ample revenue from its intrastate operations to give it a fair return both as to all its lines within the State and also as to that portion to which the order referred.

The total tonnage of all kinds of freight on the 80 miles of railroad from Indianapolis to the Illinois boundary cannot be ascertained from the evidence. The amount of traffic moving on commodity rates is not shown. Evidence was adduced to show that in 1904-5-6 the new rates would have caused a large reduction in the gross revenue from that particular traffic; but the Commission found that the former rates were excessive; and the effect of this reduction upon the company's net return was to be satisfactorily proved and could not be assumed.

The conclusion in the court below was reached in the following manner. The complainant showed, and the Master found, that for the year 1904 the operating expenses upon the line between Indianapolis and the Illinois boundary were 74.50 per cent. of the whole earnings upon that line from every source, and that after consolidation, in the years 1905 and 1906, the operating expenses of the entire St. Louis division were respectively 73.03 and 72.64 per cent. of the entire earnings of that division. These ratios were then applied for the purpose of determining the expense of transporting that part of the freight which moved under class rates between stations on the road from Indianapolis to the Illinois boundary. Thus, it was assumed that, as the gross revenue from this classified freight was $79,803 in 1904, the expense of transporting it was 74.50 per cent. of that amount or $59,453; that, in 1905, with a gross revenue of $91,067, the expense was 73.03 per cent. thereof or $66,506; and that in 1906, with a gross revenue of $102,241, the expense was 72.64 per cent. or $74,267. According to this method of calculation, the revenue which would have been received under the order of the Commission would have been less than the expense of transportation.

It is plain, however, that it does not follow from the mere fact that the total operating expenses of a railroad, or of a division

of a railroad, bear a given relation to the entire receipts of that road or division, that the cost of transportation in the case of a particular class of traffic bears the same relation to the revenue derived from that class. The ratio, in the first case, is found by bringing together a great variety of operations involving various rates and different outlays for different sorts of traffic. It is predicated of the whole volume of business considered as such, and may be far from true of some part of it considered separately. It does not purport to be an expression of the relative cost of any specified part but simply of that of the entire traffic to which it applies.

How hazardous may be the use of such a ratio to determine the relative cost of a fragment of the business is apparent in this case. Thus it appeared that the total gross earnings of the complainant's St. Louis division in the year 1905 was $4,750,811. Of this, the entire gross receipts from the classified freight here in question were only $91,067, or less than 2 per cent. The expenses of the division for that year were $3,469,544, or 73.03 per cent. of the total earnings as stated. In 1906, the earnings of the St. Louis division were $5,480,094, and the expenses were $3,980,906, or 72.64 per cent. These amounts embrace interstate and intrastate traffic, freight and passenger, and all freight whether moving on class or commodity rates. A large increase or reduction in the class rates on the particular intrastate freight in question, the volume of business being the same (as is the assumption), would have had a very slight effect upon the ratio of cost to earnings based on the entire operations.

The ratio of total expense to total earnings affords, in itself, no sufficient basis for determining the cost of the transportation of the particular traffic covered by the order under review. It alone furnishes no ground for invalidating the finding of the Commission that the existing rates were exorbitant and that the substituted rates would be fair. Before such a ratio could properly be used in setting forth the cost of a specified portion of the traffic, it would be necessary to have evidence either justifying the conclusion that the cost in proportion to the revenue was substantially the same for that part of the traffic as for the whole, or, if there were a material difference, satisfactorily showing its nature and extent.

In the case of *Smyth vs. Ames*, 169 U. S. 466, the legislature of Nebraska had established a classification for all intrastate freight carried by railroad and had fixed the maximum rates to be charged therefor. With other evidence, the court had before it the testimony and exhibits furnished by one of the defendants in that case, a secretary of the State Board of Transportation and a principal witness for that board, who gave the results of his investigations with respect to the traffic of each company within the State. The ratio of expense to earnings on all business done within the State was thus shown, but reliance was not placed upon that alone. . . . That case cannot be regarded as affording basis for a contention that a ratio of expense to earnings on the entire business of a railroad, or of a division, can be taken to show the cost of some particular item or class of traffic. Each case must depend upon its special facts; and the record in the present case is barren of the necessary proof. There are certain statements with respect to the heavier cost of the operation of local as compared with through trains, but these statements are clearly inadequate. Local traffic may cost more per unit of freight movement than through traffic, but whether it cost more in proportion to revenue is another matter. That, of course, depends upon the rates charged and is a fact to be proved. There was testimony with respect to the cost of handling freight over the platform at the Indianapolis terminal, but this fell far short of the showing required, and it appeared that of the six classes of freight, to which the order applied, the fifth and sixth classes constituting much more than one-half in tonnage of the classified freight always moved in carload lots loaded by the shipper.

The evidence showed that the class rates on local traffic on the line between Indianapolis and the Illinois boundary, which were maintained by the Vandalia Company and condemned by the Commission as unreasonable, were higher than the class rates for corresponding distances to local stations in Indiana on other lines (including one of the Vandalia Company's divisions) running out of Indianapolis to the east and south. It wholly failed to sustain the contention that the action of the Commission in ordering the reduction complained of transcended the limits imposed by the Fourteenth Amendment.

Railway Officers.

Executive, Financial and Legal Officers.

R. G. Shorter has been appointed assistant auditor of the Georgia & Florida, with office at Augusta, Ga.

Thomas Bond has been appointed commerce counsel of the St. Louis & San Francisco, with office at St. Louis, Mo., succeeding F. H. Wood, resigned.

Fred H. Wood, general attorney and commerce counsel of the St. Louis & San Francisco at St. Louis, Mo., has been appointed general attorney and commerce counsel of the Southern Pacific Company, with headquarters at New York, succeeding James G. Wilson, resigned.

E. S. Taylor has been appointed eastern agent of the Pullman Company, with headquarters at New York, succeeding to the duties of Silas W. Bretzfield, assistant treasurer and eastern purchasing agent, who was retired under the pension rules of the company on November 1. Mr. Bretzfield was born on August 31, 1846, at New York, and entered the service of Pullman's Parlor Car Company in 1873, as private secretary to president and vice-president. He was subsequently assistant purchasing agent and then assistant treasurer and chief purchasing agent of the Pullman Company.

Operating Officers.

H. F. Burch has been appointed trainmaster of the Delaware & Hudson, with office at Mechanicville, N. Y.

John Rourke, assistant superintendent of the Boston & Maine at Concord, N. H., has been appointed superintendent of the Portland division, succeeding C. E. McMullin, resigned.

J. T. Slattery, superintendent of the Green River division of the Denver & Rio Grande at Helper, Utah, has been appointed superintendent of the Second division, with headquarters at Salida, Colo., succeeding I. H. Luke, transferred.

Marion Johnson Wise, who has been appointed assistant to general manager of the Mobile & Ohio and the Southern Railway in Mississippi, with headquarters at Mobile, Ala., as has been announced in these columns, was born on August 16, 1883, in St. Louis county, Missouri, and was educated in the public schools of St. Louis county. He began railway work on January 11, 1901, with the Mobile & Ohio, and from December of the same year until April, 1903, was clerk in the general manager's office; he was then until March, 1907, secretary to the general manager. From March to December, 1907, he was chief clerk to the superintendent of transportation, and then became chief clerk to the general manager of the same road. In March, 1911, he was appointed superintendent of the Southern Railway in Mississippi, which position he held at the time of his recent appointment as assistant to general manager of the same road, also of the Mobile & Ohio, as above noted.

M. J. Wise.

R. F. Armstrong assistant superintendent of the Ashland division of the Chicago & North Western at Antigo, Wis., has been appointed superintendent of the Iowa & Minnesota division, with office at Mason City, Iowa, succeeding H. Rettinghouse, resigned to accept service with the Chicago, St. Paul, Minneapolis & Omaha. T. M. Coughlin, trainmaster at Antigo, succeeds Mr. Armstrong as assistant superintendent, and E. Doner takes the

place of Mr. Coughlin. E. E. Cunningham has been appointed trainmaster at Proviso, Ill.

Ralph F. Dawson, whose appointment as assistant superintendent of the Buffalo, Rochester & Pittsburgh, with headquarters at Du Bois, Pa., has been announced in these columns, was born on September 22, 1871, at Liberty, Ohio, and was educated in the common schools. He began railway work in January, 1888, on the Bradford division of the Erie, and the following July went to the Baltimore & Ohio as agent and operator. He was promoted the following year to copier in the train despatcher's office at Foxburg, Pa., and in January, 1890, was made train despatcher, first at Foxburg and later at Butler, until November, 1899. He then entered the service of the Buffalo, Rochester & Pittsburgh as train despatcher at Butler; one year later, he was appointed chief despatcher at Butler. He was later transferred in the same capacity to Punxsutawney and then to Du Bois, remaining in that position until October 1, 1913, when he was appointed assistant superintendent of the same road, as above noted.

James D. Tyter, whose appointment as general superintendent of the Boston & Maine, with headquarters at Boston, Mass., has been announced in these columns, was born on August 1, 1864, at Gilboa, N. H., and began railway work as a water boy with a construction crew. In 1880 he was put in charge of a construction crew. He was soon promoted to freight brakeman and then successively to places as passenger brakeman, fireman, conductor and agent. In 1888 he was appointed general yardmaster at Worcester, Mass.; and in 1891 was promoted to general yardmaster at Williamstown, which at that time was the largest yard on the Fitchburg division. In 1896 Mr. Tyter was transferred in the same capacity to Boston, and subsequently was general yardmaster of the North Station. On January 1, 1905, he was appointed assistant superintendent of the Terminal division. He was made assistant superintendent of the Fitchburg division, in December, 1907, in charge of lines west of East Deerfield, and on November 1, 1911, was promoted to assistant superintendent of the entire division. He was made superintendent of the division in November, 1912, and this position he held at the time of his recent appointment as general superintendent, as above noted. His entire service has been on the Boston & Maine lines.

J. D. Tyter.

Traffic Officers.

W. H. Chevers has been appointed general agent of the Union Pacific and Oregon Short Line at Ogden, Utah.

W. F. Van Norte has been appointed traffic manager of the Ashley, Drew & Northern, with office at Crossett, Ark.

W. W. Avery has been appointed assistant general passenger agent of the Kansas City Southern, with headquarters at Kansas City, Mo.

H. H. Pierce has been appointed traveling freight agent of the Hocking Valley, with office at Columbus, Ohio, in place of W. H. Hartsough.

D. M. Bowman has been appointed assistant general passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio.

J. B. Baird, general freight agent of the Northern Pacific, has been appointed freight traffic manager, with headquarters at St. Paul, Minn., effective November 1.

William J. Smith has been appointed traveling freight and passenger agent of the El Paso & Southwestern and the Morenci Southern, with headquarters at New York City.

A. A. Boyle, traveling freight agent of the Missouri Pacific, with headquarters at New Orleans, La., has been appointed commercial agent of the Missouri & North Arkansas at New Orleans, succeeding T. F. Ellzey, resigned.

Wilfred S. R. Cameron, traveling agent of the Chicago, St. Paul, Minneapolis & Omaha at Vancouver, B. C., has been appointed general agent, with office at Winnipeg, Man., succeeding H. M. McGinnis, resigned, and Edward A. Dye succeeds Mr. Cameron.

John S. Talbot has been appointed general agent of the Chicago & North Western at Indianapolis, Ind., succeeding J. J. Livingston, transferred. Mr. Talbot was formerly for a number of years connected with the North Western, and more recently was general agent of the Western Maryland at Chicago.

E. R. Eudaly has been appointed agent of livestock, dairy and poultry division of the freight traffic department of the Queen & Crescent Route, with headquarters at Chattanooga, Tenn. He will have charge of the work of developing the livestock, dairy and poultry industry along the lines of the Cincinnati, New Orleans & Texas Pacific and the Alabama Great Southern.

D. L. Moorman, traveling passenger agent of the Cincinnati, Hamilton & Dayton, with headquarters at Toledo, Ohio, has been appointed Northern passenger agent at Detroit, Mich., succeeding J. Lee Barrett, resigned. B. M. McNeff, traveling passenger agent, with office at Dayton, Ohio, succeeds Mr. Moorman, and Mr. McNeff is succeeded by F. B. Dickinson, heretofore city ticket agent at Dayton.

D. G. Gray, general western freight agent of the Western Maryland of Pittsburgh, Pa., has been appointed general freight agent, with headquarters at Baltimore, Md. M. H. Jacobs, general agent at Pittsburgh, has been promoted to assistant general freight agent, with headquarters at Pittsburgh. S. J. Lamoreaux, general agent at Cleveland, Ohio, succeeds Mr. Jacobs, and Brent Arnold, Jr., general agent at Cincinnati, succeeds Mr. Lamoureaux.

C. A. Benscoter, assistant general passenger agent of the Southern Railway, at Chattanooga, Tenn., has been transferred to Knoxville. John L. Meek, assistant general passenger agent at Atlanta, Ga., has been transferred to Chattanooga, succeeding Mr. Benscoter; J. C. Beam, assistant general passenger agent at St. Louis, Mo., has been transferred to Atlanta, succeeding Mr. Meek, and F. N. Westerman, chief clerk in the passenger department at Washington, D. C., has been promoted to assistant general passenger agent, succeeding Mr. Beam.

J. W. Rhodes, assistant commercial agent of the Illinois Central at Chicago, has been appointed export and import agent, with headquarters at Chicago, succeeding C. A. Florence, deceased. L. W. Hazlehurst, commercial agent at Evansville, Ind., succeeds Mr. Rhodes; B. T. Breckenridge, commercial agent at Indianapolis, Ind., takes the place of Mr. Hazlehurst, and B. W. Fredenburg succeeds Mr. Breckenridge. H. E. Shutt has been appointed contracting freight agent at Detroit, Mich., succeeding W. C. Pfeifer, who has been made traveling freight agent at Detroit in place of B. W. Fredenburg.

M. H. Jacobs, who has been appointed assistant general freight agent of the Western Maryland, with headquarters at Pittsburgh, Pa., was born on August 12, 1877, at Waynesboro, Pa., and was educated in the public schools. He began railway work on October 1, 1893, as a messenger boy on the Western Maryland at York, Pa., and in December, 1900, was transferred to the commercial freight agent's office of the same road at Baltimore, Md. In February, 1904, he was made soliciting freight agent and subsequently became traveling freight agent at the same place. He was appointed general agent with headquarters at Pittsburgh, Pa., in August, 1912, which position he held at the time of his recent appointment as assistant general freight agent of the same road as above noted.

H. B. Rogers, freight soliciting agent of the Southern Railway, at Norfolk, Va., has been appointed commercial agent, with office at Norfolk, and the freight soliciting agency at Nor-

folk has been discontinued. C. W. Westbury, district passenger agent at Philadelphia, Pa., has been appointed assistant general agent, with headquarters at Washington, D. C. S. E. Burgess, division passenger agent at Richmond, Va., has been appointed division passenger agent at Philadelphia, succeeding Mr. Westbury. H. L. Bishop, passenger agent at Washington, D. C., has been appointed division passenger agent with office at Richmond, Va., succeeding Mr. Burgess, and John T. Richmond, succeeds Mr. Bishop. G. A. Fisher, traveling passenger agent at Memphis, Tenn., has been transferred in the same capacity to Cleveland, Ohio, succeeding C. R. Chesney, resigned to go into other business. P. N. Estes, city passenger and ticket agent at Columbus, Ga., succeeds Mr. Fisher, and R. G. Parish succeeds Mr. Estes.

Engineering and Rolling Stock Officers.

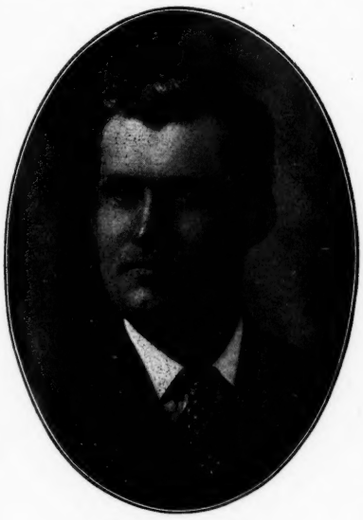
George H. Funk, formerly superintendent of fuel economy of the Chesapeake & Ohio, has been appointed chief smoke inspector for all the railroads entering Cincinnati, Ohio.

W. J. Frey has been appointed supervisor of materials of the Lake Shore & Michigan Southern, with headquarters at Cleveland, Ohio, succeeding H. W. Gardner, resigned.

A. B. Warner, vice-president and general superintendent of the Chicago, Rock Island & Gulf, has been appointed, also, chief engineer, with headquarters at Ft. Worth, Tex., succeeding H. M. Stone, resigned.

A. F. Blaess, district engineer of the Illinois Central, at Memphis, Tenn., has been transferred to Chicago as district engineer, succeeding James Clifford, resigned, and D. W. Thrower, assistant engineer maintenance of way at Chicago, has been promoted to district engineer at Memphis, succeeding Mr. Blaess.

Hugh D. Mackenzie, whose appointment as division master mechanic of the Intercolonial Railway, with headquarters at Stellarton, N. S., has already been announced in these columns, was born on July 22, 1864, at Churchville, Pictou county, N. S., and was educated in the public schools of Moncton, N. B. He began railway work on July 24, 1881, with the Intercolonial Railway as a machinist apprentice, remaining in that position until 1886, and then for twelve years was machinist. He was appointed charge hand at Moncton, N. B., in 1898, and the following year became mechanical foreman at Stellarton, N. S., remaining in that position until 1909, when he was appointed general locomotive foreman at Moncton, N. B., which position he held at the time of his recent appointment, as division master mechanic, with headquarters at Stellarton, N. S., of the same road, as above noted.



H. D. Mackenzie.

Walter U. Appleton, whose appointment as general master mechanic of the Intercolonial and the Prince Edward Island railways, with headquarters at Moncton, N. B., has been announced in these columns, was born on January 29, 1878, at Moncton, and was educated in the public schools. He began railway work on October 13, 1890, with the Canadian Government Railways as a junior clerk. From 1895 to 1899 he was apprentice machinist and then was clerk, for one year, becoming machinist in 1901. Two years later he was made chief clerk to the superintendent of motive power, remaining in that position until 1907. He was appointed assistant to superintendent of motive power on the Intercolonial in 1909, which position he held at the time of his recent appointment as general master mechanic, as above noted.

George Edward Smart, who has been appointed master car builder of the Intercolonial and the Prince Edward Island railways, with headquarters at Moncton, N. B., as has been announced in these columns, was born on December 23, 1873, at Edinburgh, Scotland, and was educated in the public schools. He began railway work in August, 1893, with the Grand Trunk, and held various positions on that road until 1897, when he was promoted to car inspector. From 1904, to 1906, he was general inspector of heating and lighting on the eastern lines of the Canadian Pacific, and then to 1909, was general car inspector on the eastern lines of the same road. In 1909 he was made division car foreman in charge of passenger and freight car work on the eastern division of the Canadian Pacific, which position he held at the time of his recent appointment as master car builder of the Canadian government railways as above noted.

OBITUARY.

Frederick A. Haskell, formerly general freight agent of the New York Central & Hudson River, died on November 3 at his home in Brooklyn, N. Y.

William G. Gordon, assistant auditor of the treasury department of the Chicago, Burlington & Quincy, at Chicago, died at his home at Hinsdale, Ill., on November 1.

Jacob Johann, from 1892 to 1897 superintendent of machinery of the Chicago & Alton, died recently at his home in Springfield, Ill. He was born at Rheinzabern, Bavaria, Germany, on November 15, 1830. He began railway work in November, 1858, and to July, 1861, was assistant to master mechanic on the Missouri Pacific, subsequently for about four years he was master mechanic in shops on the Southwest branch at Pacific City, Mo. From March, 1865, to May, 1868, he was general master mechanic of the Missouri Pacific, and from April, 1870, to January, 1872, held the same position on that road. In October, 1872, he was appointed general master mechanic of the Chicago & Canada Southern, and from June, 1874, to November, 1884, was general master mechanic of the Wabash, St. Louis & Pacific, and then to May of the following year was superintendent of motive power and machinery of the same road. From July to November, 1885 he was master mechanic of the Missouri, Iowa & Nebraska, now part of the Chicago, Burlington & Quincy, and then to December, 1886, was master mechanic of the Chicago & Atlantic, now part of the Erie. He was appointed superintendent of motive power and rolling stock of the Texas & Pacific at Marshall, Tex., in December, 1886, remaining in that position until June, 1888; subsequently he had charge of the Chicago office of the Safety Car Heating & Lighting Company, and from November 5, 1892, to February, 1897, he was superintendent of machinery of the Chicago & Alton. Previous to entering railway service he was for 12 years employed in various locomotive work.

DEMURRAGE IN ENGLAND.—As the result of several conferences between representatives of the railway companies and of the shippers affected, the regulations regarding the enforcement of demurrage charges for detention of freight cars, which came into force on English and Welsh railways at the beginning of the present year, have been modified to the extent of enlarging the free period at private sidings. For general traffic the January regulations allow a free period, before conveyance, of one day exclusive of the day on which loading is begun; this free period has now been extended to two days, exclusive of the day on which loading is begun, while the free period after conveyance is now to be three days instead of two, exclusive of the day of arrival. In the case of traffic for shipment two free days, instead of one day, are now allowed before conveyance, and after conveyance four days, whereas, under the January regulations, only two days were allowed for coastwise shipment traffic and four days for foreign shipment traffic. The new arrangement as to shipment traffic is, however, subject to the proviso that the term coastwise does not include traffic delivered to barge or other craft for works or wharves within the port area, and that the South-Eastern & Chatham Railway only allows two days, exclusive of day of arrival, on coastwise shipment traffic. The charges on expiry of the respective free periods remain at 36 cents per car per day for ordinary freight cars.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Skaneateles Railway has ordered one six-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 26 in., the diameter of the driving wheels will be 50 in., and the total weight in working order will be 132,000 lbs. The steam pressure will be 180 lbs.

The Chicago, St. Paul, Minneapolis & Omaha has ordered 4 Pacific type locomotives and 6 mikado locomotives from the American Locomotive Company. The Pacific type locomotives will have 25 in. x 28 in. cylinders, 75 in. driving wheels, a steam pressure of 170 lbs., and in working order will weigh 260,000 lbs. The mikado locomotives will have 27 in. x 32 in. cylinders, 61 in. driving wheels, a steam pressure of 170 lbs., and in working order will weigh 300,000 lbs.

CAR BUILDING.

The Chicago, Milwaukee & St. Paul has ordered 3 private cars from the Pullman Company.

The Northern Pacific is said to be in the market for 250 ore cars. This item has not been confirmed.

The Minneapolis, St. Paul & Sault Ste. Marie is in the market for 6 coaches, 2 parlor cars and 2 buffet observation cars.

The Lehigh Valley is in the market for 1,000 fifty-ton hopper cars, about 75 coaches and about 25 combination baggage and express cars.

IRON AND STEEL.

The Pere Marquette has ordered 2,000 tons of rails from the Illinois Steel Company.

The Paulista Railway, Brazil, has ordered 3,000 tons of rails from the United States Steel Products Company.

The Atlantic Coast Line has ordered 15,000 tons of rails for 1914 requirements from the Tennessee Coal, Iron & Railroad Company.

The Philadelphia & Reading has divided an order for 24,000 tons of rails for 1914 requirements between the Bethlehem Steel Company, the Carnegie Steel Company, the Lackawanna Steel Company and the Pennsylvania Steel Company.

General Conditions in Steel.—The steel industry continues to be very dull, with a declining tendency in both orders and prices, and continued smaller production at the mills. In general, however, manufacturers are inclined to be rather optimistic. Many contend that the present condition represents only a temporary lull. Most steel mills in the East are operating at from 60 to 75 per cent. of capacity, but large mills in the Central West are operating at about 85 per cent. capacity. With the present market conditions further recessions in operations are expected before the end of the month.

SIGNALING.

The Philadelphia & Reading is installing automatic block signals on its line between Port Clinton, Pa., and Buck Mountain, 30 miles, double track. The signals are Hall enclosed disks. At present the telegraph block system is in use on this part of the line.

Spanish Railway Contracts.—The contract for constructing section 6 of the railway from Ripoll to Puigcerda has been awarded to Lorenzo Sunier, Barcelona, at $304,252. No bids were submitted September 2 for completing construction on the railway from Bocaleones to Malaga.

Supply Trade News.

The J. Faessler Manufacturing Company, Moberly, Mo., has moved its St. Louis, Mo., office from 810 Olive street to the Railway Exchange building.

Charles A. Eggert, who for the past 12 years has been with the Consolidated Car Heating Company, has been made sales engineer of the Railway Utility Company, Chicago.

Ashmead Gray Rodgers, for 12 years superintendent of the Carborundum Company's plant at Niagara Falls, N. Y., died on October 23, as the result of injuries sustained through an accident on October 5. Mr. Rodgers was a native of Albany, N. Y., having been born there in 1872. Previous to his coming to the Carborundum Company as superintendent he was superintendent of the Eddy Electrical Company, Hartford, Conn. His funeral services were held at Niagara Falls on Saturday, October 25, from St. Peter's Church, and were attended by several hundred of the employees of the Carborundum Company, members of the Niagara Club and other friends. Mr. Rodgers was a member of the American Chemical Society, Engineers' Society of New York, Chemists' Club, Niagara Club, University Club and Country Club of Niagara Falls.

The Union Switch & Signal Company recently gave a dinner to its veterans at the Fort Pitt hotel, Pittsburgh, Pa. There are 87 men who have been in the employ of the company 21 years or more. Of these, 83 were present at the dinner. Two of the absent ones were too far away, and two were too ill to attend. Of the 87 veterans 53 are stockholders in the company, their holdings being worth $140,000 in the market today. They have been leaders in a beneficial association which has been in existence many years, has paid out large sums of money in sick and death benefits and has never been helped financially by the company. These veterans, too, have been the backbone of a shop loan association, established in recent years, to keep the employees out of the hands of the loan sharks. This association is run entirely with capital subscribed by the men and is not helped financially by the company.

H. E. Gifford, Jr., has been appointed sales manager for the National Electric Specialty Company, Toledo, O., effective November 1. He resigned as Western representative of the L. S. Brach Supply Company to accept this position, with headquarters in Chicago. Mr. Gifford has been in the signal business since 1905, when he went to work for the New York Central at Mott Haven, N. Y., as an accountant in the office from which the Electric Zone work was handled. In May, 1906, he was appointed chief clerk to Azel Ames, then signal engineer of the N. Y. C. Electric Zone. In 1907, when the organization was disbanded, he went into the accounting department of the Union Switch & Signal Company's Pennsylvania terminal construction department. In 1910 he entered the employ of the American Conduit Company and was later connected with the installation of the underground conduit system of the New York, Westchester & Boston. He went to the L. S. Brach Supply Company in January, 1912.

The annual convention of the district managers and salesmen of the Sherwin-Williams Company, Cleveland, was held at the Auditorium hotel, Chicago, October 27-29, and was attended by some 75 representatives of the company. Details for the interesting event were arranged by Adrian B. Joyce, general manager; H. M. Ashby, district manager; S. H. Stewart, sales manager, and Thomas Madill, manager western railroad department. The various meetings were presided over by Mr. Ashby, Mr. Stewart and Clyde E. Horton, manager of the publicity and promotion department. Plans for increased efficiency and sales promotion were discussed, and the company's literature, from its own printing plant and presses, was shown and commented on. The feature of the gathering was a display of motion pictures showing the operations of the "Brighten-Up Club" (a Sherwin-Williams organization) in a typical country town. The films will be exhibited throughout the country. A banquet at the Chicago Athletic Association on Wednesday night, arranged by L. B. Quinn, chairman of the entertainment committee, and presided over by Mr. Joyce as toastmaster, closed the convention.

Railway Construction.

CANADIAN PACIFIC.—Application has been made to the Canadian parliament for an extension of time to build the following lines: From or near Hawarden to a point at or near Floral or Cheviot, Sask.; from or near Sedgwick southerly to a point in township 39 or 40, range 11, 12 or 13, west 4th meridian, Alta.; from a point on the Wilkie branch to a point near the North Saskatchewan river in township 51 or 52, range 1 or 2, west 4th meridian in Saskatchewan and Alberta; from the northwesterly terminus of the Asquith branch to a point at or near Battleford, Sask.; from a point at or near Irricana to a point in township 20 or 21, range 11 to 14, west 4th meridian, Alb., and from Killam to Strathcona, Alta.

CHICAGO, BURLINGTON & QUINCY.—The report of this company for the year ended June 30, 1913, shows that on the extension from Thermopolis, Wyo., east to Powder River the bridge work and grading were completed, and on the section from Powder River to Orin Junction grading work and bridge construction was continued, and some of the right of way was secured. All the work has been finished west of Casper, and the company expects next year to continue the construction work through to Orin Junction to complete the entire line. No work was carried out on the Hudson-Greeley line, in Colorado except to secure some of the right of way. Additional land was bought during the year for needed facilities in Chicago, in Aurora, in Denver and at other places. The company placed in operation during the year 58.46 miles of additional second track and 74.54 miles of yard tracks and sidings. A new yard was built at Eola, Ill., containing six tracks having a total length of about 4,000 ft., together with necessary water and coal stations. The existing third track from Chicago to Belmont, Ill., is being extended to Aurora, and for a distance of about nine miles north of Keokuk, Iowa, the tracks have been raised and rebuilt to place them above the flow line caused by the new power dam across the Mississippi river at that point. The company spends a large amount of money each year in protecting the lines from the encroachment of the Missouri river at Folsom, Iowa. The tracks between Pacific Junction and Council Bluffs have been protected for about two miles with heavy revetment work, and this work is being carried out on one mile additional to hold the bed of the river in its course and protect the east approach of the company's bridge over the Missouri river near Plattsmouth.

DES QUINZE & BLANCHE RIVER.—This company has applied to the Canadian parliament for an extension of time to build from Dymond, on the Temiskaming & Northern Ontario to the mouth of the Des Quinze river, thence to Des Quinze lake in the province of Quebec. The Bronson Company, Ottawa, Ont., are the contractors, also the owners through a subsidiary company. Some construction work has already been carried out.

INTERCOLONIAL RAILWAY.—This company is asking for bids November 10, for building from North Sydney, N. S., to Leitches Creek.

NAVAJO SOUTHERN.—This company which was organized last year has given a contract to the L. J. Smith Construction Company, it is said, to build from Holbrook, Ariz., south through a lumber and mining section for a distance of about 80 miles. F. H. Bowen, president; W. H. Clark, secretary; R. W. Hill, treasurer, and E. S. Clark, counsel.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, is asking for bids for the construction of three sections of the new subway and elevated lines in the borough of the Bronx, as follows: On November 26, for a section of the White Plains road extension of the existing subway, known as Section No. 2 of Route No. 18, in White Plains road, between Burke avenue and East 241st street. This is to be an elevated line with three tracks; bids are wanted on November 28, for the Jerome avenue section, known as Section No. 1 of Route No. 16, which will be mainly in Jerome avenue, between 157th street and River avenue and East 182d street. This will also be a three track elevated line and will join the subway now being constructed south of 157th street; bids are wanted on December 1 for work on the Southern Boulevard branch, known as Section No. 1-A of Routes Nos. 19 and 22. This is to be built in Southern boulevard and Whitlock avenue, between East 147th street and Bancroft street. It is to be a three track underground line as far north as a point in Whitlock avenue between Aldus and Bancroft streets, from which point north it is to be an elevated structure.

The commission is asking for bids on November 21, for building Section No. 2 of Route No. 39, the New Utrecht avenue branch of the Fourth avenue subway in the borough of Brooklyn. This section is from a point near the intersection of Tenth avenue and Thirty-ninth street, Brooklyn, and will be built as an elevated line over Tenth avenue to New Utrecht avenue, thence over New Utrecht avenue and other streets and private property to Eighty-sixth street, and over Eighty-sixth street to a point near Bay Forty-first street, thence over Stillwell avenue to a point just north of Avenue Y, where a connection will be made with the Sea Beach line to Coney Island. The line will be a three track elevated structure, and will be operated by the New York Municipal Railway Corporation in connection with the Fourth avenue subway.

PETERSBURG & COLUMBIA SPRINGS.—Incorporated in West Virginia with $25,000 capital and headquarters at Fairmont, to build from a point near Petersburg, in Grant county, W. Va., southwest to Columbia Sulphur Springs, in Greenbrier county, about 100 miles. The incorporators include A. R. Watson, M. C. Hite, L. Bailey, J. F. Hite and R. L. Long, of Fairmont.

SUDBURY, KEPAWA & BELL RIVER.—Application has been made in Canada for incorporation to build railway lines from Sudbury, Ont., in a generally eastern direction to the south end of Lake Temiskaming, thence northeasterly to the National Transcontinental in the province of Quebec, where the National Transcontinental crosses the Bell river. John Thompson, Ottawa, Ont., is solicitor for the applicants.

TEMPLE, NORTHWESTERN & GULF.—A franchise has been granted by the Temple, Tex., city council permitting this company to enter the city, and construction work on the line, which has been held up for two months pending the granting of the franchise, will be renewed. The line will parallel the tracks of the Santa Fe road into Temple. The company was organized some time ago to build from Temple, northwest via Gatesville and Hamilton, about four miles of track has been laid. It is understood that an extension is to be built east to a connection with the Missouri, Kansas & Texas, at Trinity, about 120 miles. (August 29, p. 396.)

UNGAVA RAILWAY.—Application has been made in Canada for incorporation to build from the Hudson's Bay Company's post at the mouth of the Great Whale river, or from a point between the mouth of the Great Whale river and the mouth of the Nastapoka river on the eastern coast of Hudson Bay, thence easterly or southeasterly to Aylmer sound on the Gulf of St. Lawrence, or to some other feasible point on the gulf. Pentland, Stuart, Gravel & Thomson, Ottawa, Ont., are solicitors for applicants.

RAILWAY STRUCTURES.

BATHURST, N. B.—An officer of the Intercolonial Railway writes that work on the new station at Bathurst is nearing completion. It is a brick building with stone trimmings 75 ft. long x 24 ft. wide. (October 17, p. 728.)

BAY CITY, MICH.—The Michigan Central has announced that work is to be started shortly on the erection of car shops and a new freight house at this place.

OTTUMWA, IOWA.—The Chicago, Burlington & Quincy during the fiscal year ended June 30, 1913, put in service new freight houses at Ottumwa, Iowa, at Des Moines and at St. Joseph, Mo., also a new general office building at Chicago.

TRURO, N. S.—An officer of the Intercolonial Railway writes that work on the new station at Truro is about finished. The walls are of red stone with dressed trimmings. The central part of the building is 115 ft. 8 in. long x 24 ft. wide, two stories high, with offices on the second floor. There is a one story portion at each end of the main building, one 80 ft. long x 50 ft. wide, and the other 122 ft. long x 50 ft. wide. (October 17, p. 728.)

Railway Financial News.

ALABAMA GREAT SOUTHERN.—Stockholders are to vote on November 26 on authorizing a mortgage to secure $25,000,000 bonds.

ATCHISON, TOPEKA & SANTA FE.—This company has leased the Port Bolivar Iron Ore Railway, which runs from Longview, Tex., through Ore City to the mines, in all about 36 miles.

ATLANTA, BIRMINGHAM & ATLANTIC.—The resignation of H. M. Atkinson as co-recevier with E. T. Lamb has been accepted, and Mr. Lamb is now sole receiver.

BANGOR & AROOSTOOK.—Charles A. Milliken, of Augusta, Maine, has been elected a director, succeeding Arthur Holland, of Concord, Mass.

BUFFALO & SUSQUEHANNA RAILROAD.—This road is to be sold under foreclosure on December 4.

CHICAGO & NORTH WESTERN.—All of the $10,000,000 first mortgage 5 per cent. bonds of the St. Louis, Peoria & Northwestern, guaranteed principal and interest by the Chicago & North Western, offered by Kuhn, Loeb & Co., New York, were almost immediately sold.

CHICAGO, ROCK ISLAND & PACIFIC.—Effective on November 1, this company, as lessee, took over and will operate as part of its own line the St. Paul & Kansas City Short Line.

FAIRMOUNT & VEBLEN.—This road, just financed by the farmers along the line, has begun operation. The road runs from Fairmount, N. D., to Veblen, S. D., about 37 miles.

HOCKING VALLEY.—The $4,000,000 one-year 5 per cent. notes which were approved of by the Public Utilities Commission of Ohio, as mentioned in these columns last week, have been sold through Kuhn, Loeb & Co. and the National City Bank, both of New York, at 99½.

MEXICAN RAILWAY.—A semi-annual dividend of 1¼ per cent. has been declared on the ordinary stock for the half year ended June 30, 1913. This is the same rate as was paid in the previous half year, making the total yearly payment 2½ per cent., compared with 3⅞ per cent. paid in the previous year.

MIDDLETOWN, UNIONVILLE & WATER GAP.—This road has been sold under foreclosure to a bondholders' committee representing first and second mortgage bondholders. It has heretofore been operated by the New York, Susquehanna & Western, but, it is understood, will now be operated as an independent property.

NEW YORK CENTRAL & HUDSON RIVER.—The entire issue of $12,000,000 one-year 5 per cent. notes of the New York Central & Hudson River, which J. P. Morgan & Co., New York, offered at 99½, were sold on the morning of the day of offering.

NEW YORK, SUSQUEHANNA & WESTERN.—See Middletown, Unionville & Water Gap.

PACIFIC RAILWAYS OF NICARAGUA.—Brown Brothers & Co. and J. & W. Seligman & Co., both of New York, have bought from the Republic of Nicaragua 51 per cent. of the stock of the Pacific Railways of Nicaragua, incorporated under the laws of Maine. The railway company is the only one operating in Nicaragua and runs from Corinto, on the Pacific coast, to Managua and Granada, with branches, about 165 miles. The road has been operated under the management of J. G. White & Co., in New York, who will continue to be in charge of the active operation.

PORT BOLIVER IRON ORE RAILWAY.—See Atchison, Topeka & Santa Fe.

ST. LOUIS & SAN FRANCISCO.—Charles H. Sabin, vice-president of the Guaranty Trust Company, New York, and chairman of the stockholders' protective committee of the St. Louis & San Francisco, has written a letter to stockholders which says in part:

"The annual meeting of the stockholders of the 'Frisco will be held in St. Louis, November 10. Some stockholders have solicited proxies for that meeting.

"We have not thought it necessary to concern ourselves particularly over the election of a board of directors which will be without power, and whose duties will be perfunctory, so long as the property is in the hands of receivers appointed by the court.

"The receivers appointed by Judge Sanborn are operating the road and managing the property satisfactorily, and the results obtained by them show a decided improvement. Under their administration it has been practicable to provide for the interest due November 1 on the general lien 5 per cent. bonds outstanding. The court has authorized this payment and the issuance, from time to time, of a total of $10,000,000 receivers' certificates to meet prior claims and provide for necessary improvements, subject to the approval of the court as to application of proceeds.

"The early rehabilitation or reorganization of the property would not seem to be impossible. It will, however, require a considerable amount of new money. The purpose of this committee is, either to devise some plan, or to assist in the carrying out of some plan for the rehabilitation or reorganization of the property which will conserve the rights and interests of the stockholders.

"The committee does not believe that any plan can be made acceptable to the large body of security holders, or can be effectively carried out unless coincidentally the board of directors shall be changed and so constituted as to command the confidence of the stockholders and bondholders, and of the investing public generally.

"Thus far, all we have asked of the stockholders is that they should pledge their stock under an agreement which does not commit them to the payment of any money or debar them from the sale of their stock."

ST. LOUIS, PEORIA & NORTHWESTERN.—See Chicago & North Western.

TOLEDO, ST. LOUIS & WESTERN.—C. Pilz, a stockholder, has sent out a circular protesting against the Toledo, St. Louis & Western investment in Chicago & Alton.

UNION PACIFIC.—*The Commercial & Financial Chronicle* says that about $80,000,000 has so far been received from the sale of the $88,357,000 certificates of interest in the Southern Pacific. Almost the entire amount has been invested in short term securities, mostly one-year notes.

EMPLOYEES' WAGES IN AUSTRALIA.—Although the Acting Premier of Australia was disinclined to make any pronouncement regarding what action the government proposed to take in relation to the minimum wage question as affecting railway employees, it is practically certain that now the Premier has returned arrangements will be made with the Railway Commissioners to increase the rate to $2 a day. The Railway Commissioners prefer to be silent on the point, but from a reliable source it has been ascertained that they are fully convinced that $2 a day is by no means an extravagant wage. The increase will mean a considerable addition to the operating expenses of the railways, and it is not improbable that a corresponding increase in fares and freight rates will have to be made to meet the situation.

ENCOURAGING RAILWAY EXTENSIONS IN ENGLAND.—On the Belfast & Northern Counties Railway, before it was absorbed by the Midland, there was, and perhaps still is, an arrangement to encourage suburban travel. To certain undeveloped areas the company gave a free season-ticket to and from Belfast for all the heads of households who owned and resided in houses of a certain rental. Now something on the same lines has been done in connection with the extension from Ponteland, on the North-Eastern Railway, to Darras Hall. Darras Hall is a communal estate, acquired and developed by the Northern Allotment Society of Newcastle-on-Tyne, and consists of nearly 1,000 acres, laid out into parcels of 5 acres each, and divided by broad tar-macadamed roads running north and south and east and west, each lot fronting upon a roadway. Practically every lot has been disposed of. The railway extension has cost the North-Eastern $45,000, and it is to receive from the estate a perpetual rent of $1,800, but this sum is to be reduced in proportion as each lot has its house occupied, as the owner of the house will then begin to travel and so bring traffic to the line, and therefore his share of the rent is not to be paid.

[ADVERTISEMENT.]

ANNUAL REPORT.

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—FIFTY-NINTH ANNUAL REPORT.

Chicago, July 1, 1913.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended June 30, 1913:

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

YEARS ENDED JUNE 30.

Per Cent.	1913.		1912.	Per Cent.
		OPERATING REVENUES.		
67.88	$64,063,856.49	Freight Revenue	$57,740,418.62	66.58
23.20	21,895,690.73	Passenger Revenue	21,083,418.74	24.31
2.47	2,329,351.41	Mail Revenue	2,368,447.34	2.73
3.07	2,894,812.78	Express Revenue	2,578,810.37	2.98
2.28	2,146,658.47	Miscellaneous Transportation Revenue	2,031,281.77	2.34
.96	909,376.59	Revenue from Operations other than Transportation	788,588.94	.91
.14	134,739.04	Joint Facilities	132,102.19	.15
100.00	$94,374,485.51	Total Operating Revenue	$86,723,067.97	100.00
		OPERATING EXPENSES.		
13.28	$12,535,862.55	Maintenance of Way and Structures	$13,541,030.39	15.61
17.10	16,133,215.36	Maintenance of Equipment	14,294,032.69	16.48
1.68	1,586,802.81	Traffic Expenses	1,528,114.63	1.76
31.79	29,997,717.32	Transportation Expenses	29,020,384.11	33.47
2.74	2,589,292.99	General Expenses	2,263,387.34	2.61
66.59	$62,842,891.03	Total Operating Expenses	$60,646,949.16	69.93
33.41	$31,531,594.48	Net Operating Revenue	$26,076,118.81	30.07
.....	127,691.01	Net Deficit from Outside Operations	122,700.51	.....
.....	$31,403,903.47	Total Net Revenue	$25,953,418.30	.....
	3,563,358.62	Taxes Accrued	3,303,058.11	
	$27,840,544.85	Operating Income	$22,650,360.19	
		OTHER INCOME.		
	$ 632,910.23	Rents	$ 614,749.50	
	1,327,019.67	Miscellaneous Interest	1,536,294.65	
	$ 1,959,929.90	Total Other Income	$ 2,151,044.15	
	$29,800,474.75	Gross Corporate Income	$24,801,404.34	
		DEDUCTIONS FROM GROSS CORPORATE INCOME.		
	$ 1,158,071.87	Rents	$ 1,469,055.04	
	305.52	Miscellaneous Interest	13,493.46	
	8,546,453.42	Interest Accrued on Funded Debt	8,547,309.04	
	655,450.28	Sinking Funds	657,978.58	
	9,447.77	Discount on Funded Debt	6,814.44	
	$10,369,728.86	Total Deductions	$10,694,650.56	
	$19,430,745.89	Net Corporate Income	$14,106,753.78	
	$ 8,867,128.00	Dividends	$ 8,867,128.00	
	7,647,743.21	Appropriations for Betterments.	3,944,216.08	
	$16,514,871.21		$12,811,344.08	
	$ 2,915,874.68	Surplus for the Year	$ 1,295,409.70	

CAPITALIZATION.

CAPITAL STOCK.

Number of Shares.	Total Par Value Authorized and Outstanding.	Dividends Declared During the Year. Rate.	Amount.
1,108,391	$110,839,100.00	8%	$8,867,128.00

FUNDED DEBT.

Description of Bond.	Total Par Value. Authorized.	Outstanding.	In Treasury, in Sinking Funds or Pledged as Collateral.	In Hands of Public.	Interest Accrued During Year.
Mortgage	$215,789,000	$198,157,800	$22,931,000	$175,226,800	$7,834,923.74
Collateral Trust	7,968,000	7,310,200	5,435,900	1,874,300	292,408.00
Plain or Debenture	13,300,000	3,667,000	3,034,000	633,000	419,121.68
Total	$237,057,000	$209,135,000	$31,400,900	$177,734,100	$8,546,453.42

MILEAGE.

MILEAGE OF ROAD OPERATED.

STATE.	Line Owned.	Operated Under Lease.	Total Line Operated.
Illinois	1,672.16	112.88	1,785.04
Iowa	1,365.09	73.47	1,438.56
Missouri	1,122.31	10.89	1,133.20
Wisconsin	222.49	.53	223.02
Minnesota	23.61	14.84	38.45
Nebraska	2,850.34	22.37	2,872.71
Kansas	259.32	.82	260.14
Colorado	394.36	34.97	429.33
South Dakota	281.48	.....	281.48
Wyoming	482.75	.....	482.75
Montana	134.38	49.45	183.83
Total	8,808.29	320.22	9,128.51

LINE OWNED.

STATE.	Single Track.	Second Track.	Third Track.	Yard Track and Sidings.	Total.
Illinois	1,672.16	331.09	23.55	918.90	2,945.70
Iowa	1,365.09	244.53	.....	330.12	1,939.74
Missouri	1,122.31	104.95	.....	416.27	1,643.53
Wisconsin	222.49	61.31	.....	69.41	353.21
Minnesota	23.61	2.25	.....	30.57	56.43
Nebraska	2,850.34	17.99	.....	686.67	3,555.00
Kansas	259.32	.....	.....	23.78	283.10
Colorado	394.36	.....	.....	128.68	523.04
South Dakota	281.48	.....	.....	62.73	344.21
Wyoming	482.75	.....	.....	151.02	633.77
Montana	134.38	.....	.....	35.88	170.26
Total	8,808.29	762.12	23.55	2,854.03	12,447.99

TRAFFIC AND OPERATING STATISTICS.

ITEM.	1913. Dollars and Whole Numbers.	1913. Cents and Decimals.	1912. Dollars and Whole Numbers.	1912. Cents and Decimals.	Increase or Decrease. Dollars and Whole Numbers.	Increase or Decrease. Cents and Decimals.
PASSENGER TRAFFIC.						
Number of Passengers Carried Earning Revenue	23,100,539	.....	22,404,120	.....	Inc. 696,419	.....
Number of Passengers Carried One Mile	1,139,958,615	.....	1,100,846,373	.....	Inc. 39,112,242	.....
Number of Passengers Carried One Mile, per Mile of Road	125,139	.....	121,314	.....	Inc. 3,825	.....
Average Distance Carried, Miles	49	35	49	14	Inc.	21
Total Passenger Revenue	$21,895,690	73	$21,083,418	74	Inc. $812,271	99
Average Amount Received from each Passenger	.....	94784	.....	94105	Inc.	00679
Average Receipts per Passenger per Mile	.....	01921	.....	01915	Inc.	00006
Total Passenger Service Train Revenue	$27,820,639	23	$26,721,933	24	Inc. $1,098,705	99
Passenger Service Train Revenue per Mile of Road	$3,054	02	$2,944	78	Inc. $109	24
Passenger Service Train Revenue per Train Mile	$1	52022	$1	46264	Inc.	05758
FREIGHT TRAFFIC.						
Number of Tons Carried of Freight Earning Revenue	33,389,439	.....	30,111,513	.....	Inc. 3,277,926	.....
Number of Tons Carried One Mile	8,791,435,597	.....	7,675,979,757	.....	Inc. 1,115,455,840	.....
Number of Tons Carried One Mile per Mile of Road	965,083	.....	845,900	.....	Inc. 119,183	.....
Average Distance Haul of One Ton, Miles	263	30	254	92	Inc. 8	38
Total Freight Revenue	$64,063,856	49	$57,740,418	62	Inc. $6,323,437	87
Average Amount Received for each Ton of Freight	$1	91869	$1	91755	Inc.	00114
Average Receipts per Ton per Mile	.....	00729	.....	00752	Dec.	00023
Freight Revenue per Mile of Road	$7,032	63	$6,363	04	Inc. $669	59
Freight Revenue per Train Mile	$3	52568	$3	29282	Inc.	23286
OPERATING.						
Operating Revenues	$94,374,485	51	$86,723,067	97	Inc. $7,651,417	54
Operating Revenues per Mile of Road	$10,360	00	$9,556	96	Inc. $803	04
Operating Revenues per Train Mile	$2	64737	$2	47941	Inc.	16796
Operating Expenses	$62,842,891	03	$60,646,949	16	Inc. $2,195,941	87
Operating Expenses per Mile of Road	$6,898	60	$6,683	35	Inc. $215	25
Operating Expenses per Train Mile	$1	76285	$1	73389	Inc.	02896
Net Operating Revenue	$31,531,594	48	$26,076,118	81	Inc. $5,455,475	67
Net Operating Revenue per Mile of Road	$3,461	40	$2,873	61	Inc. $587	79
Net Operating Revenue per Train Mile	.....	88452	.....	74552	Inc.	13900
Average Number of Passengers per Car Mile	16	.....	15	.....	Inc. 1	.....
Average Number of Passengers per Train Mile	62	.....	60	.....	Inc. 2	.....
Average Number of Passenger Cars per Train Mile	6	23	6	19	Inc.	04
Average Number of Tons of Freight per Loaded Car Mile	19	10	18	20	Inc.	90
Average Number of Tons of Freight per Train Mile	483	83	437	75	Inc. 46	08
Average Number of Freight Cars per Train Mile	36	96	35	37	Inc. 1	21
Average Number of Loaded Cars per Train Mile	25	34	24	05	Inc. 1	29
Average Number of Empty Cars per Train Mile	10	66	10	36	Inc.	30
Average Mileage Operated During Year	9,109	51	9,074	34	Inc. 35	17

*Including Cabooses.

EXPENDITURES FOR NEW LINES AND EXTENSIONS, FOR EQUIPMENT, AND FOR ADDITIONS AND BETTERMENTS, DURING THE YEAR.

ACCOUNT.	New Lines and Extensions.	Additions and Betterments. Charged to Road and Equipment.	Charged to Income.	Total Expenditure.
I.—ROAD.				
Engineering	$ 35,467.83	$ 37,110.72	$ 46,297.71	$ 118,876.26
Right of Way and Station Grounds	183,119.15	2,400,435.56	.....	2,583,554.71
Real Estate	.....	8,256.99	.....	8,256.99
Grading	346,591.98	633,382.23	214,992.77	1,194,966.98
Tunnels	27,629.67	.....	313.91	27,943.58
Bridges, Trestles and Culverts	254,738.34	276,460.05	599,636.98	1,130,835.37
Ties	164,366.43	305,992.25	7,082.87	477,441.55
Rails	211,635.84	485,722.81	311,654.92	1,009,013.57
Frogs and Switches	5,038.99	53,660.14	21,178.59	79,877.72
Track Fastenings and Other Material	107,113.38	160,156.56	371,620.98	638,890.92
Ballast	24,744.28	88,766.18	119,692.85	233,203.31
Track Laying and Surfacing	74,838.92	355,478.12	130,218.81	560,535.85
Roadway Tools	.....	2,200.00	.....	2,200.00
Fencing Right of Way	5,276.41	12,702.35	190.54	18,169.30
Crossings and Signs	463.40	29,730.59	83,469.77	113,663.76
Interlocking and Other Signal Apparatus	195.74	150,990.96	71,144.55	222,331.25
Telegraph and Telephone Lines	6,107.44	875.83	55,888.19	62,871.46
Station Buildings and Fixtures	13,404.58	97,522.17	457,504.05	568,430.80
General Office Building and Fixtures	.....	.....	650,000.00	650,000.00
Shops, Engine Houses and Turn Tables	2,820.22	11,683.44	57,044.57	71,548.23
Shop Machinery and Tools	.....	27,527.17	1,237.97	28,765.14
Water Stations	65,921.84	24,328.03	135,882.72	226,132.59
Fuel Stations	481.54	13,108.13	746.26	14,335.93
Storage Warehouses	.....	3,717.99	.....	3,717.99
Dock and Wharf Property	16,227.76	.....	.....	16,227.76
Miscellaneous Structures	3,735.81	2,240.52	76,496.26	82,472.59
Transportation of Men and Material	107.52	.....	.....	107.52
Rent of Equipment	42,320.94	.....	.....	42,320.94
Repairs of Equipment	8,601.22	.....	.....	8,601.22
Earnings and Operating expenses during construction	1,544.83	.....	.....	1,544.83
Total	$1,602,494.06	$5,182,048.79	$3,412,295.27	$10,196,838.12
II.—EQUIPMENT.				
Steam Locomotives	.....	$2,537,254.00	$ 109,794.08	$ 2,647,048.08
Passenger Train Cars	.....	15.61	41,811.77	41,827.38
Freight Train Cars	.....	389,492.92	328,467.51	717,960.43
Work Equipment	.....	332,136.58	4,821.07	336,957.65
Floating Equipment	.....	531.65	553.51	1,085.16
Total	.....	$3,259,430.76	$ 485,447.94	$ 3,744,878.70
III.—GENERAL EXPENDITURES.				
Law Expenses	$ 1.00	.....	.....	$ 1.00
Taxes	.....	.....	.....	.....
Other Expenditures	648.50	.....	.....	648.50
Total	$649.50	.....	.....	$649.50
Grand Total	$1,603,143.56	$8,441,479.55	$3,897,743.21	$13,942,366.32

MILEAGE STATISTICS.

ITEM.	1913. Miles.	1912. Miles.	Increase or Decrease. Miles.
LOCOMOTIVE MILEAGE—Revenue Service.			
Freight Locomotive Miles	19,130,297	18,375,751	Inc. 754,546
Passenger Locomotive Miles	17,862,403	17,892,325	Dec. 29,922
Mixed Locomotive Miles	844,265	851,499	Dec. 7,234
Special Locomotive Miles	17,310	19,580	Dec. 2,270
Switching Locomotive Miles	9,951,205	8,914,030	Inc. 1,037,175
Total	47,805,480	46,053,185	Inc. 1,752,295
Locomotive Mileage—Non-revenue Service	2,260,030	2,075,482	Inc. 184,548
CAR MILEAGE—Revenue Service.			
Freight Car Mileage:			
Loaded	460,405,258	421,665,175	Inc. 38,740,083
Empty	193,706,979	181,749,213	Inc. 11,957,766
Caboose	17,427,153	16,756,425	Inc. 670,728
Total	671,539,390	620,170,813	Inc. 51,368,577
Passenger Car Mileage:			
Passenger	46,273,265	45,718,181	Inc. 555,084
Sleeping, Parlor and Observation	26,388,011	26,862,496	Dec. 474,485
Other Passenger Train Cars	41,336,527	40,584,537	Inc. 751,990
Total	113,997,803	113,165,214	Inc. 832,589
Car Mileage in Special Service:			
Freight, Loaded	207,178	248,069	Dec. 40,891
Freight, Empty	320	44	Inc. 276
Caboose	16,219	18,700	Dec. 2,481
Passenger	60,598	74,265	Dec. 13,667
Sleeping, Parlor and Observation	.....	331	Dec. 331
Other Passenger Train Cars	86	187	Dec. 101
Total	284,401	341,596	Dec. 57,195
Total Car Mileage — Revenue Service	785,821,594	733,677,623	Inc. 52,143,971
Car Mileage—Non-revenue Service	10,136,338	9,075,026	Inc. 1,061,312
TRAIN MILEAGE—Revenue Service.			
Freight Train	17,331,661	16,688,629	Inc. 643,032
Passenger Train	17,461,373	17,422,976	Inc. 38,397
Mixed Train	838,983	846,642	Dec. 7,659
Special Train	16,378	19,067	Dec. 2,689
Total Train Mileage—Revenue Service	35,648,395	34,977,314	Inc. 671,081
Train Mileage—Non-revenue Service	1,331,388	1,279,407	Inc. 51,981

EQUIPMENT.

ITEMS. LOCOMOTIVES—Owned.	Number on June 30, 1912.	Number Added During Year.	Number Retired During Year.	Number on June 30, 1913.	Average Tractive Power All Locomotives and Average Capacity All Freight Cars.
Passenger	437	31	12	456	.....
Freight	873	102	53	922	.....
Switching	362	43	11	394	.....
Total Locomotives	1,672	176	76	1,772	29,261 lbs.
CARS—Owned.					
Passenger Service:					
First-class Cars	660	...	1	659	.....
Combination Cars	230	1	...	231	.....
Dining Cars	37	...	...	37	.....
Baggage, Express and Postal Cars	268	...	1	267	.....
Parlor Cars	14	...	...	14	.....
Other Cars in Passenger Service	45	...	...	45	.....
Total	1,254	1	2	1,253	.....
Freight Service:					
Box Cars	29,597	1,000	2,824	27,773	.....
Flat Cars	1,205	502	104	1,603	.....
Stock Cars	6,481	1,000	186	7,295	.....
Coal Cars	15,780	1,502	734	16,548	.....
Tank Cars	113	...	...	113	.....
Refrigerator Cars	2,462	...	144	2,318	.....
Other Cars in Freight Service	88	...	3	85	.....
Total	55,726	4,004	3,995	55,735	38.85 tons
Company's Service:					
Officers' and Pay Cars	32	...	...	32	.....
Gravel Cars	978	...	3	975	.....
Derrick Cars	40	1	...	41	.....
Caboose Cars	680	2	...	682	.....
Other Road Cars	4,150	666	245	4,571	.....
Total	5,880	669	248	6,301	.....
Total Cars Owned	62,860	4,674	4,245	63,289	.....

NEW WORK.

Charges to Capital Account aggregating $10,044,623.11 were made during the fiscal year for additions to the property.

On the extension from Thermopolis to Powder River, Wyoming, $936,133.76 was expended during the year in the completion of bridges and track laying, for riprapping along the Badwater River, erecting station buildings and water plants, and in grading and tunnel work at Alkali Summit.

On the extension from Powder River to Orin Junction, Wyoming, $554,489.26 has been expended this year for grading and bridge construction and in the purchase of right of way, etc. The above expenditure practically completed the grading and bridge construction of the line west of Casper, and it is expected next year to continue construction through to Orin Junction, thereby completing the entire line.

The amount expended on the Hudson-Greeley line, in Colorado, during the year was $85,066.76 for right of way; no actual work on this line has yet been done.

Additional land was purchased for needed facilities in Chicago, Aurora, Denver and other points. New second track costing $1,681,692.39 has been laid at various points and freight and passenger stations rebuilt where business and public convenience required these additions and improvements. There were placed in operation during the year 58.46 miles of additional second track and 74.54 miles of yard tracks and sidings.

A new yard has been built at Eola, Illinois, containing six tracks with a total length of about 4,000 feet, together with necessary water and coal stations.

The existing third track from Chicago to Belmont, Illinois, is being extended to Aurora, and the completion of automatic block signals covering this trackage has been authorized and the work is now under way, all of which improvements will provide facilities necessary for the more efficient and expeditious handling of business between these points.

For a distance of about nine miles north of Keokuk, Iowa, the tracks of the Company have been raised and rebuilt in order to place them above the flow line caused by the new power dam across the Mississippi River at that point.

Large expense is annually incurred in protecting the railroad property from encroachment of the Missouri River at Folsom, Iowa. Not only have the tracks of the line, Pacific Junction to Council Bluffs, been protected for some two miles with very heavy and expensive revetment work, but an additional mile is being put in to hold the bed of the river in its course and protect the east approach to the Company's bridge, over the Missouri River, near Plattsmouth.

Freight houses at Ottumwa, Des Moines and St. Joseph, which at the close of the last year were in course of construction, have been completed and put in service.

The new General Office building at Chicago was completed during the year and is now occupied.

Following is the report of the General Auditor, with statements prepared by him.

By order of the Board of Directors.

DARIUS MILLER,
President.

GENERAL BALANCE SHEET.

JUNE 30, 1913.

ASSETS.

Property Investment—Road and Equipment:		
Road	$347,091,626.64	
Equipment	66,139,343.78	
General Expenditures	1,522,250.89	$414,753,221.31
Reserve for Accrued Depreciation—Credit		21,816,162.81
Total		$392,937,058.50
Securities:		
Securities of Proprietary, Affiliated and Controlled Companies, Pledged—		
Stocks		$ 19,363,139.38
Securities Issued or Assumed, Pledged—		
Funded Debt		31,000.00
Securities of Proprietary, Affiliated and Controlled Companies, Unpledged—		
Stocks	$7,727,860.45	
Funded Debt	676,050.00	8,403,910.45
Total		$ 27,798,049.83
Other Investments:		
Advances to Proprietary, Affiliated and Controlled Companies for Construction, Equipment and Betterments.		$ 402,197.83
Miscellaneous Investments—		
Physical Property	$1,430,056.41	
Securities Unpledged	1,489,396.89	2,919,453.30
Total		$ 3,321,651.13
Working Assets:		
Cash		$ 4,815,365.57
Securities Issued or Assumed, Held in Treasury—		
Funded Debt		11,858,600.00
Marketable Securities—		
Stocks	$763,072.12	
Funded Debt	62,500.00	825,572.12
Loans and Bills Receivable		3,255,493.31
Traffic and Car Service Balances due from other Companies		759,279.66
Net Balance Due from Agents and Conductors		2,555,470.72
Miscellaneous Accounts Receivable		2,823,320.92
Materials and Supplies		6,846,071.90
Other Working Assets		132,312.82
Total		$ 33,871,487.02
Deferred Debit Items:		
Advances—		
Temporary Advances to Proprietary, Affiliated and Controlled Companies	$ 170,998.17	
Working Funds	167,139.24	
Other Advances	3,399,238.58	$ 3,737,375.99
Insurance Paid in Advance		145,201.10
Cashs and Securities in Sinking Funds		19,371,131.81
Securities in Provident Funds		496,538.89
Unextinguished Discount on Funded Debt		657,250.99
Other Deferred Debit Items		2,593,207.22
Total		$ 27,000,706.00
Grand Total		$484,928,952.48

LIABILITIES.

Capital Stock:		
Common Stock		$110,839,100.00
Mortgage, Bonded and Secured Debt:		
Funded Debt—		
Mortgage Bonds—		
Held by Company	$ 11,445,000.00	
Not held by Company	186,712,800.00	$198,157,800.00
Collateral Trust Bonds—		
Held by Company	$ 281,600.00	
Not held by Company	7,028,600.00	$ 7,310,200.00
Plain Bonds—		
Held by Company	$ 163,000.00	
Not held by Company	3,504,000.00	$ 3,667,000.00
Total		$209,135,000.00
Working Liabilities:		
Traffic and Car-service Balances due to other Companies		$ 1,603,733.26
Audited Vouchers and Wages Unpaid		7,193,408.22
Miscellaneous Accounts Payable		324,368.24
Matured Interest and Dividends Unpaid		2,159,032.50
Matured Mortgage, Bonded and Secured Debt Unpaid		145,000.00
Other Working Liabilities		43,151.85
Total		$ 11,468,694.07
Accrued Liabilities not Due:		
Unmatured Interest and Sinking Fund Payments		$ 1,506,611.55
Taxes Accrued		98,400.00
Total		$ 1,605,011.55
Deferred Credit Items:		
Operating Reserves		$ 1,790,957.06
Liability on Account of Provident Funds		496,538.89
Other Deferred Credit Items		440,485.04
Total		$ 2,727,980.99
Appropriated Surplus:		
Additions to Property since June 30, 1907, through Income		$ 21,421,216.24
Reserves from Income or Surplus—		
Invested in Sinking Funds		32,942,793.87
Not Specifically Invested		3,750,000.00
Total		$ 58,114,010.11
Profit and Loss:		
Income Account		$ 49,146,537.35
Profit and Loss		41,892,618.41
Total		$ 91,039,155.76
Grand Total		$484,928,952.48

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

Designation of Bond or Obligation.	Term. Date of Issue.	Term. Date of Maturity.	Total Par Value Authorized.	Total Par Value Outstanding.	Total Par Value Held by Company. In Treasury.	Total Par Value Held by Company. Pledged as Collateral.	Total Par Value Not Held by Company. In Sinking Funds.	Total Par Value Not Held by Company. In the Hands of the Public.	Interest. Rate.	Interest. When Payable.	Interest. Amt. Accrued During the Year.
MORTGAGE BONDS.											
C. B. & Q. R. R.:											
General Mortgage	1908	1958	$68,634,000	$68,634,000	$10,387,000	.....	.....	$58,247,000	4	M. & S.	$2,580,586.63
Illinois Division	1899	1949	50,835,000	50,835,000	384,000	.....	.....	50,451,000	3½	J. & J.	1,779,225.00
Illinois Division	1899	1949	34,165,000	34,165,000	189,000	.....	.....	33,976,000	4	J. & J.	1,366,600.00
Iowa Division Mortgage Sinking Fund Bonds	1879	1919	3,000,000	2,197,000	.....	.....	.....	2,197,000	5	A. & O.	110,812.45
Iowa Division Mortgage Sinking Fund Bonds	1879	1919	12,502,000	5,488,000	19,000	.....	.....	5,469,000	4	A. & O.	221,029.98
Nebraska Extension Mortgage Sinking Fund Bonds	1887	1927	29,441,000	22,238,000	316,000	$31,000	.....	21,891,000	4	M. & N.	899,686.65
B. & M. R. R. R. in Nebraska:											
Consolidated Mortgage Sinking Fund Bonds	1878	1918	13,751,000	13,613,000	92,600	.....	$10,715,200	2,805,200	6	J. & J.	816,780.00
Republican Valley R. R.:											
Mortgage Sinking Fund Bonds	1879	1919	2,643,000	932,800	18,400	.....	770,800	143,600	6	J. & J.	55,968.00
Tarkio Valley R. R.:											
Mortgage Bonds	1880	1920	430,000	28,000	3,000	.....	.....	25,000	7	J. & D.	2,088.35
Nodaway Valley R. R.:											
Mortgage Bonds	1880	1920	388,000	27,000	5,000	.....	.....	22,000	7	J. & D.	2,146.68
COLLATERAL TRUST BONDS.											
C. B. & Q. R. R.:											
Sinking Fund Bonds (Denver Extension)	1881	1922	7,968,000	7,310,200	281,600	.....	5,154,300	1,874,300	4	F. & A.	292,408.00
PLAIN BONDS.											
C. B. & Q. R. R.:											
Sinking Fund Bonds	1881	1921	4,300,000	3,667,000	163,000	.....	2,871,000	633,000	4	M. & S.	146,680.00
Plain Bonds	1883	1913	9,000,000	.....	.....	.....	.....	.....	...	.....	272,441.68
Total	....	....	$237,057,000	$209,135,000	$11,858,600	$31,000	$19,511,300	$177,734,100	...	.....	$8,546,453.42

INCOME ACCOUNT.

OPERATING INCOME.

RAIL OPERATIONS—			
Operating Revenues:			
Revenue from Transportation:			
Freight	$64,063,856.49		
Passenger	21,895,690.73		
Excess Baggage	310,373.26		
Mail	2,329,351.41		
Express	2,894,812.78		
Milk	379,720.82		
Other Passenger Train	9,766.23		
Switching	1,327,074.27		
Special Service Train	33,066.14		
Miscellaneous Transportation	86,657.75	$93,330,369.88	
Revenue from Operations other than Transportation:			
Station and Train Privileges	$ 9,063.48		
Parcel Room Receipts	12,073.75		
Storage Freight	43,222.67		
Storage Baggage	16,957.54		
Car Service	319,759.64		
Telegraph and Telephone Service	207,341.89		
Rent of Buildings and other Property	101,938.39		
Miscellaneous	199,019.23	909,376.59	
Joint Facilities, Dr.		Dr. 3,511.87	
Joint Facilities, Cr.		138,250.91	
Total Operating Revenues.		$94,374,485.51	
Operating Expenses:			
Maintenance of Way and Structures	$12,535,862.55		
Maintenance of Equipment.	16,133,215.36		
Traffic Expenses	1,586,802.81		
Transportation Expenses	29,997,717.32		
General Expenses	2,589,292.99	$62,842,891.03	
Net Operating Revenue			$31,531,594.48
OUTSIDE OPERATIONS:			
Revenues		$ 909,697.13	
Expenses		1,037,388.14	
Net Deficit from Outside Operations			$ 127,691.01
Total Net Revenue			$31,403,903.47

TAXES ACCRUED			3,563,358.62
Operating Income			$27,840,544.85
OTHER INCOME.			
Rents Accrued from Lease of Roads		$ 2,976.36	
Other Rents—Credits:			
Hire of Equipment—Balance	$ 65,740.87		
Joint Facilities	532,691.13		
Miscellaneous Rents	31,501.87	629,933.87	
Dividends Received on Stocks Owned or Controlled		529,957.00	
Interest Received on Funded Debt Owned or Controlled		489,508.14	
Interest on Other Securities, Loans and Accounts		307,554.53	1,959,929.90
Gross Corporate Income			$29,800,474.75
DEDUCTIONS FROM GROSS CORPORATE INCOME.			
Other Rents—Debits:			
Joint Facilities	$ 1,138,088.86		
Miscellaneous Rents	19,983.01	$ 1,158,071.87	
Interest Accrued on Funded Debt		8,546,453.42	
Other Interest		305.52	
Sinking Funds Chargeable to Income		655,450.28	
Extinguishment of Discount on Securities		9,447.77	$10,369,728.86
Net Corporate Income			$19,430,745.89
DISPOSITION OF NET CORPORATE INCOME.			
Dividends declared on Stock:			
2 per cent, payable Sept. 25, 1912	$ 2,216,782.00		
2 per cent, payable Dec. 26, 1912	2,216,782.00		
2 per cent, payable March 25, 1913	2,216,782.00		
2 per cent, payable June 25, 1913	2,216,782.00	$ 8,867,128.00	
Appropriations for Betterments:		7,647,743.21	$16,514,871.21
Surplus for the year			$ 2,915,874.68

SINKING FUND ASSETS ON JUNE 30, 1913.

SECURITIES IN FUNDS.

Name of Fund and Security.	Par Value.	Cost or Book Value.	Cash in Fund.	Total.
C. B. & Q. R. R. 4 and 5 per cent Bonds of 1919 (Iowa Division).	.....	.....	$ 1,439.27	$ 1,439.27
C. B. & Q. R. R. 4 per cent Bonds of 1921	$ 2,871,000	$ 2,750,548.37	59,208.04	2,809,756.41
C. B. & Q. R. R. 4 per cent Bonds of 1922 (Denver Extension).	5,154,300	5,030,130.74	40,955.57	5,071,086.31
B. & M. R. R. R. in Nebraska Consolidated Mortgage 6 per cent Bonds of 1918.	10,715,200	10,715,200.00	1,850.69	10,717,050.69
Republican Valley R. R. 6 per cent Bonds of 1919	770,800	770,800.00	999.13	771,799.13
Total	$19,511,300	$19,266,679.11	$104,452.70	$19,371,131.81

FREIGHT TRAFFIC MOVEMENT—ENTIRE LINE.

COMPANY'S MATERIAL EXCLUDED.

Commodities.	Originating on this Road. Tons.	Received from Connections. Tons.	Total Freight Tonnage. Tons.	Per Cent.
Products of Agriculture—				
Grain	3,462,079	457,108	3,919,187	11.71
Flour	623,610	126,422	750,032	2.24
Other Mill Products	258,937	53,590	312,527	.93
Hay	217,428	76,482	293,910	.88
Tobacco	3,982	1,293	5,275	.02
Cotton	1,384	15,747	17,131	.05
Fruits and Vegetables	469,084	717,058	1,186,142	3.55
Other Products	159,407	84,012	243,419	.73
Total	5,195,911	1,531,712	6,727,623	20.11
Products of Animals—				
Live Stock	1,584,311	207,267	1,791,578	5.35
Dressed Meats	189,151	7,274	196,425	.59
Other Packing House Products	122,573	6,784	129,357	.39
Poultry, Game and Fish	58,431	31,818	90,249	.27
Wool	5,782	9,578	15,360	.05
Hides and Leather	14,553	2,238	16,791	.05
Other Products	59,289	18,781	78,070	.23
Total	2,034,090	283,740	2,317,830	6.93
Products of Mines—				
Anthracite Coal	32,233	165,685	197,918	.59
Bituminous Coal	7,764,236	2,584,402	10,348,638	30.93
Coke	23,878	164,468	188,346	.56
Ores	85,318	363,266	448,584	1.34
Stone, Sand, etc	1,813,972	294,793	2,108,765	6.30
Other Products	107,059	265,175	372,234	1.12
Total	9,826,696	3,837,789	13,664,485	40.84
Products of Forests—				
Lumber	326,492	1,660,886	1,987,378	5.94
Other Products	129,034	203,776	332,810	.99
Total	455,526	1,864,662	2,320,188	6.93
Manufactures—				
Petroleum and other Oils	147,436	297,123	444,559	1.33
Sugar	110,667	122,316	232,983	.70
Naval Stores	10,492	3,230	13,722	.04
Iron, Pig and Bloom	26,693	166,217	192,910	.59
Iron and Steel Rails	31,934	180,304	212,238	.63
Other Castings and Machinery	198,568	280,844	479,412	1.43
Bar and Sheet Metal	82,864	234,786	317,650	.95
Cement, Brick and Lime	1,196,221	548,250	1,744,471	5.21
Agricultural Implements	205,565	84,893	290,458	.87
Wagons, Carriages, Tools, etc	41,218	54,550	95,768	.28
Wines, Liquors and Beers	149,875	48,537	198,412	.59
Household Goods, etc	157,993	76,685	234,678	.70
Other Manufactures	574,730	458,105	1,032,835	3.09
Total	2,934,256	2,555,840	5,490,096	16.41
Merchandise	1,394,641	677,634	2,072,275	6.19
Miscellaneous	689,896	176,086	865,982	2.59
Total Tonnage	22,531,016	10,927,463	33,458,479	100.00